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PITYRIASIS LICHENOIDES CHRONICA

A CLINICAL AND MICROSCOPIC STUDY OF A CASE MISTAKEN FOR LICHEN PLANUS *

FRED WISE, M.D.

Instructor in Dermatology, Columbia University, College of Physicians and Surgeons; Attending Dermatologist, Vanderbilt Clinic; Chief of Clinic in Dermatology, Mount Sinai and Beth Israel Hospital Dispensaries

NEW YORK

Few diseases offer to the student of dermatology a topic of more absorbing interest than the various cutaneous eruptions which today are included under the term "parapsoriasis." The great diversity in the design and morphology of their efflorescences, their remarkable chronicity and stubborn resistance to treatment, the striking absence of etiologic factors, the surprising resemblances which some eruptions bear to divers other dermatoses, but, above all, the consistent uniformity of the chief histopathologic changes displayed by totally different types of eruptions are some of the features of more than ordinary interest which characterize the parapsoriasis group. The vagaries of nomenclature which this group of affections has undergone in the twenty-five years of its existence is a suggestive index of the many angles from which different authors have viewed the whole subject.

BRIEF REVIEW OF THE LITERATURE

Beginning with the report of two cases of parakeratosis variegata, by Unna, Santi and Pollitzer,[1] in 1890, a large number of monographs dealing with related dermatoses, but under many disguises and a great variety of titles, soon appeared in the literature. Unna's cases occurred in young adult men, who presented an eruption consisting chiefly of flat, slightly elevated papules and plaques, many of which coalesced into bands and circinate lesions, forming an irregular network, in the meshes of which little islands of healthy skin remained. Some of the papules were capped by a thickened horny layer, presenting the glistening appearance of lichen planus papules, while others bore fine scales. The color varied in different localities, from pink to reddish-brown and violet. The eruptions were chronic and progressive, without remissions and exacerbations, appearing on the trunk and extremities. Subjective symptoms were lacking. Treatment was unavailing. The pathologic changes were limited to the papillary layer and the epidermis, the deeper layers of the skin, as well as the follicles and glands, remaining intact. The papillary layer exhibited a moderate grade of edema, and dilatation of the blood vessels, with slight perivascular infiltration. The epidermis was somewhat edematous, the prickle cells swollen; the transitional layers were normal in appearance, while the horny layer was thickened, showing, here and there, nucleated horn cells. The reticulated appearance of the eruption, together with the presence of parakeratosis, induced these writers to name this eruption parakeratosis variegata.

Following this report Jadassohn,[2] in 1894, demonstrated an eruption which consisted mainly of reddish, discrete and disseminated papules on the trunk and lower extremities of a male adult. The papules varied in size from a pinhead to a lentil, were round and oval in shape, showing fine scales. Histologic examination revealed a moderate perivascular, round cell infiltration in the papillary layer, with some proliferation of the prickle cells in the epidermis. The granular layer was unchanged, while the stratum corneum presented evidences of parakeratosis. Jadassohn gave to this eruption the name "psoriasiform and lichenoid exanthem," and later,[3] in 1900, called it "dermatitis psoriasiformis nodularis." Between 1896 and 1898, similar cases were reported by Neisser,[4] Juliusberg,[5] Pinkus,[6] and Rôna.[7]

In 1897, Brocq[8] described a third type, differing from those of Unna and Jadassohn, and characterized by the presence of very slightly infiltrated, sharply circumscribed, large and small plaques, covered with fine scales, and presenting a reddish or pink color. Microscopically, there was a moderate infiltration in the papillary layer, a normal prickle cell layer and an absence of parakeratosis. Brocq gave to this type the cognomen "érythrodermie pityriasique en plaques disséminées."

In 1899, Juliusberg[9] reviewed the literature of the day and reported two cases of the type first reported by Jadassohn, under the title "pityriasis lichenoides chronica."

Two years later, Crocker[10] described two instances of the disease, under the name of "lichen variegatus," by virtue of the resemblance of the eruptions to lichen planus. In 1901, Fox and MacLeod[11] published a paper in which they suggested the name "resistant maculopapular scaly erythrodermia" to the entire

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Unna, Santi and Pollitzer: Monatsh. f. prakt. Dermat., 1890, x, Nos. 9 and 10.
2. Jadassohn: Verhandl. d. deutsch. dermat. Gesellsch., IV Kongr., Breslau, 1894, p. 524.
3. Jadassohn: Festschr. Kaposi, Arch. f. Dermat. u. Syph., 1900, p. 880.
4. Neisser: Verhandl. d. deutsch. dermat. Gesellsch., IV Kongr., 1894, p. 495.
5. Juliusberg: Arch. f. Dermat. u. Syph., 1897, xli, 257.
6. Pinkus: Arch. f. Dermat. u. Syph., 1898, xliv, 77.
7. Rôna: Arch. f. Dermat. u. Syph., 1898, xlvi, 147.
8. Brocq: Rev. gén. de clin. et de thérap., September, 1897, No. 37.
9. Juliusberg: Arch. f. Dermat. u. Syph., 1899, I, 359.
10. Crocker: Brit. Jour. Dermat., 1900, xii, 443.
11. Fox and MacLeod: Brit. Jour. Dermat., 1901, xiii, 319.

group, while Török,[12] in the following year, included the various types of eruption under the title, "scaling erythrodermia, appearing in disseminated spots."

In 1902, Brocq[13] again studied the subject and decided that the various types of eruption which had been reported under different names presented many points in common, representing merely varieties of the same dermatosis. He labeled the entire group with the term "parapsoriasis," and described three types:

1. Parapsoriasis en gouttes. In this the eruption resembles psoriasis and is characterized by the presence of small, isolated, macular and papular, barely infiltrated, scaly lesions, leaving bleeding points if scratched. In this group he included the cases described by Jadassohn and Juliusberg.

2. Parapsoriasis lichenoïde. This is a subvariety clinically resembling both psoriasis and lichen planus, in which there are small papular elements, some of them flattened and glistening, others atrophic in appearance, with a tendency toward confluence of the lesions and the formation of a fine meshed reticulum or of variously sized patches, giving to the whole a variegated and marmorated appearance. In this group are included the parakeratosis variegata of Unna, Santi and Pollitzer and the lichen variegatus of Crocker.

3. Parapsoriasis en plaques. In this the eruption consists of large, sharply defined patches, either slightly desquamating or entirely free of scales, and resembling both psoriasis and dermatitis seborrhoeica. This variety was previously described as érythrodermie pityriasique en plaques disséminées. Many examples of the last type resemble the early stages of mycosis fungoides.[14]

Under the term "xanthoerythrodermia perstans," Crocker,[15] in 1905, described a subvariety of parapsoriasis en plaques, characterized, as the name indicates, by a more pronounced yellowness than usually obtains.

Fig. 1.—Pityriasis lichenoides chronica, front view.

Fig. 2.—Pityriasis lichenoides chronica, rear view.

Civatte,[16] in 1906, reported two cases clinically resembling pityriasis lichenoides chronica, in which microscopic examination revealed the structure of a tuberculous granuloma in the upper layers of the corium. This observer, together with Milian and Pinard,[17] believed that some cases represent a transition or connecting link between parapsoriasis and certain forms of cutaneous tuberculosis—an opinion which, as far as I know, has not been substantiated by other investigators.

Although Brocq's classification has been subjected to considerable adverse criticism, more especially by Arndt,[18] it seems to have answered its purpose and has been accepted by the majority of writers on the subject of parapsoriasis, abroad and in this country. Among American authors, Brocq's classification is recognized in the publications of Corlett and Schultz,[19] J. C. White,[20] C. J. White,[21] Trimble,[22] Sutton,[23] and others. That this classification into three separate subdivisions is a purely arbitrary one, however, has been amply demonstrated by several reports of cases in which different types of parapsoriasis obtained in the same patient, at the same time, or at different times. It is enough to say, in this connection, that both Csillag[24] and Klausner[25] had observed patients who at one time exhibited an eruption corresponding to pityriasis lichenoides chronica and who, under further observation, developed an eruption resembling parakeratosis variegata. To cap the climax Werther[26] recently published the report of a patient whose skin exhibited the three varieties of parapsoriasis at the same time, thus going far to support the contention that Brocq's classification is chiefly one of convenience.

The recent American literature has been enriched by two excellent contributions to the subject of parapsoriasis; one, by Heimann,[27] dealing with the histopathology of the group as a whole, the other, by Stokes,[28] who has taken up the subject of experimental therapy and intradermal sensitization reactions in relation to his case of pityriasis lichenoides chronica.

In the past few years I have had occasion to study eight examples of various types of the disease and have been fortunate in obtaining biopsy material from all of them. Five of these eight cases corresponded to Brocq's parapsoriasis en plaques, the other three, to

12. Török: Mracek's Handb. d. Hautkrankh., 1905.
13. Brocq: Ann. de dermat. et de syph., 1902, p. 443.
14. Wise and Rosen: Jour. Cutan. Dis., 1916, xxxiv, 95.
15. Crocker: Brit. Jour. Dermat., 1905, xvii, 119.
16. Civatte: Les parapsoriasis de Brocq, Paris, 1906.
17. Milian and Pinard: Bull. et mém. Soc. méd. d. hôp. de Paris, April 26, 1907.
18. Arndt: Arch. f. Dermat. u. Syph., 1900, c, 7.
19. Corlett and Schultz: Jour. Cutan. Dis., February, 1909, p. 49.
20. White, J. C.: Jour. Cutan. Dis., 1900, xviii, 536.
21. White, C. J.: Jour. Cutan. Dis., 1903, xxi, 153.
22. Trimble, W. B.: The Chronic Scaly Erythrodermias, THE JOURNAL A. M. A., July 24, 1909, p. 264.
23. Sutton: Jour. Missouri State Med. Assn., December, 1913.
24. Csillag: Arch. f. Dermat. u. Syph., 1905, lxxvi, 3.
25. Klausner: Dermat. Wchnschr., 1913, lvi, 469.
26. Werther: Dermat. Ztschr., 1915, xxii, 320.
27. Heimann: Jour. Cutan. Dis., 1916, xxxiv, 203.
28. Stokes: Jour. Cutan. Dis., 1916, xxxiv, 343.

pityriasis lichenoides chronica. Of the latter, one has been incorporated in a previous report,[29] while the second forms the subject of the present paper.

From the clinical point of view, the interesting features in these eruptions are manifested by the many variations in the types of lesions occurring in different cases, and in their remarkable resemblances to other, nonrelated dermatoses, demanding the consideration of the most careful diagnostic differentiation. From the histologic side, the uniformity of the morbid changes depicted in sections derived from totally different types of gross lesions seems to be a very important feature of the entire group. In all of these sections, the microscopic changes conformed in all essential details to those so often described in the different forms of parapsoriasis. One of the moot points in the histopathology is the question of the presence or absence of parakeratosis. In all but one of the cases mentioned above, nucleated horn cells were easily demonstrated, occurring to the same extent in the patchy variety of the disease as they did in the guttate form. Both Brocq and Arndt state that parakeratosis was absent in the sections of parapsoriasis in patches, which they had examined; while Civatte, as Hallmann points out, emphasized its occurrence in that type. It is probable that parakeratosis forms a part of the minute changes in the different varieties of the affection, but that its occurrence is not always readily demonstrable.

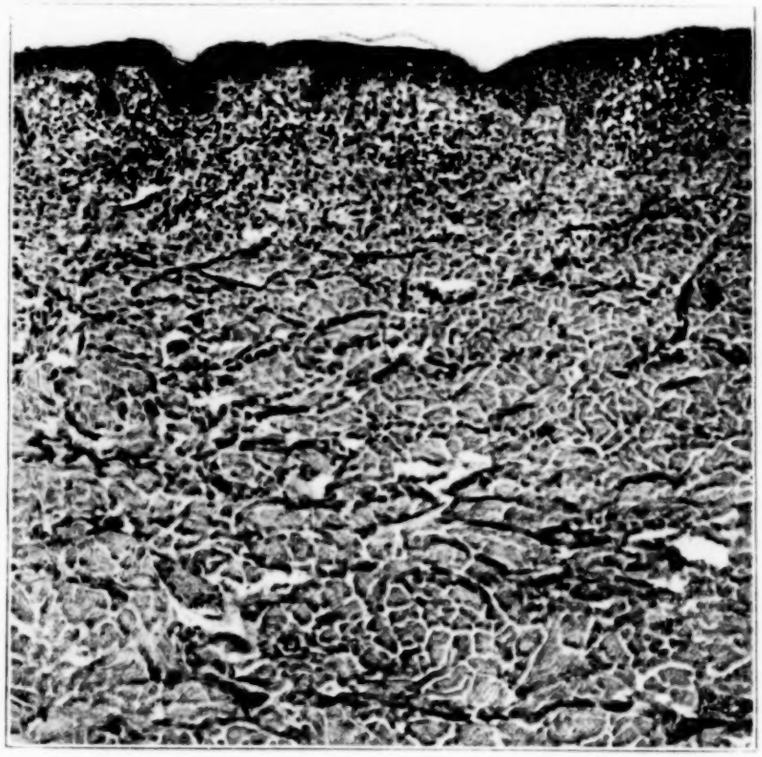

Fig. 3.—Microscopic section of papule (low power), showing edema of epidermis and upper corium, with moderate cellular infiltration.

REPORT OF CASE

The following brief report concerns a case of the lichenoid type of parapsoriasis, presenting an unusually widespread eruption. The patient, from Dr. Fordyce's service at the Vanderbilt Clinic, was presented before the New York Dermatological Society at its October, 1915, meeting, where the majority of the members who examined the patient's skin considered the eruption to be one of lichen planus:

History.—J. C., man, aged 58, a native of this country, was married and had always been in the best of health, with the exception of an attack of rheumatism, three years before. Under the administration of salicylates and potassium iodid, the rheumatic pains promptly disappeared and have not returned since. There is no history of a drug rash following the ingestion of these medicines. The family and personal histories have no bearing on the present eruption. Ten years ago, an epithelioma was removed from the left temple by Dr. Gottheil, the operation leaving a smooth, white scar. There are no evidences of syphilitic disease.

Examination.—The patient is well nourished and apparently in good health. Physical examination reveals no abnormalities. The Wassermann test is negative and the urine is normal. The cutaneous sensibilities are everywhere undisturbed.

Skin: The eruption made its appearance about two and a half years ago, on the anterior surfaces of the forearms, in the form of small, red, round and oval papules which itched slightly. Shortly after, similar lesions developed on all parts of the body, with the exception of the neck, face and scalp, and the palms and soles. The mucous membranes remained free. Since the onset of the trouble, none of the lesions have shown any tendency toward retrogression. With the spread of the disease, pruritus has become a serious symptom, often depriving the patient of sleep. Scratch marks, however, are not present.

With the exception of the areas mentioned above, the entire integument, including that of the genitals, is involved. The lesions consist of innumerable macules and papules, varying in size from a pinhead to a lentil. These elements are round and oval, of a dull red, smooth, free of scales, their surfaces somewhat burnished when viewed at an angle. The lesions are everywhere closely crowded, more so on the arms and legs than elsewhere. A distinct grouping of the macules and papules occurs on the forearms, anteriorly, and on the skin overlying the shins. Similar grouped elements are also seen on the abdomen and flanks. On various parts of the upper and lower extremities, a number of the lesions have coalesced so as to form patches with irregular borders, sharply defined against the surrounding normal skin. These patches vary in diameter from a quarter of an inch to an inch and a half. Their surfaces are reddish-pink on the forearms, somewhat violaceous on the legs, smooth and glistening in appearance. On the anterior portions of the forearms, several areas present a linear arrangement of the papules, forming curved lines, from 1 to 2 inches in length, and running parallel with the long axis of the arm. The papular lesions predominate in all parts of the eruption, being especially marked on the extremities and trunk; most of them are flat topped, sharply outlined, but not angular or polygonal; in various parts of the body, closer scrutiny reveals the presence of scattered papules which possess an umbilicated center. The macular elements are most numerous on the backs of the hands, the upper part of the chest and on the genitals. Many of the lesions appear to be in the transitional stage, from macule to papule. Neither pigmentation nor scaling forms a part of the eruption.

Forcible scratching of a papule with a curet results in a brisk oozing of blood.

Treatment and Result.—Prolonged administration of Fowler's solution, at the hands of other physicians, proved

29. Wise, Fred: New York Med. Jour., Nov. 20, 1915.

unavailing in effecting a retrogression of the lesions, or in stopping the progress of the disease. Three autogenous serum injections had no effect on the pruritus, nor did they effect any change in the skin lesions. The Kromayer light was applied to the skin of the abdomen in six weekly exposures, resulting in a partial fading of the papules, for the time being; as soon as the last traces of irritation from the ultraviolet rays had subsided, the skin assumed the same appearance as that of the untreated areas.

Histopathology.—A lentil sized papule, including the adjacent normal integument, was removed with a cutaneous punch, from the skin between the shoulder blades, and prepared for microscopic study.

The main pathologic changes consisted of a rather well defined cellular infiltration, located chiefly in the papillary and subpapillary portions of the corium; a pronounced edema, with minute vesicle formation in the subepidermal portions of the skin; marked vascular dilatation in this region, with granular degeneration of the collagenous tissue; in the deeper parts of the corium the collagen was edematous, the walls of the blood vessels were thickened and the glandular structures showed signs of degeneration. In the epidermis, edema of varying intensity prevailed.

The horny layer was thin and adherent. Nucleated horn cells were present in only one very minute portion of this stratum, corresponding to only two or three adjacent papillae, the rest of the epidermal surface presenting no signs of parakeratosis. The stratum lucidum was absent. The granular layer was attenuated, for the most part consisting of a single layer of cells with well preserved cell bodies and nuclei. The stratum spinosum appeared to be normal in some areas, moderately increased in others. In the latter, evidences of intercellular and intracellular edema were pronounced, the nuclei being distorted and crowded to one side, or completely surrounded by a clear protoplasmic zone, while the intercellular spaces were widened and bridged by prominent prickles. In several areas a beginning intra-epidermal vesicle formation was apparent, the contents of the little vesicles consisting of scattered, fine granules and cell detritus. The basal cell layer varied greatly in its appearance in different parts of the section; while some portions presented a normal appearance of the palisade cells, sharply defined against the corium, other portions exhibited a complete disorganization of these cells, resulting in an obliteration of the boundary between epidermis and corium.

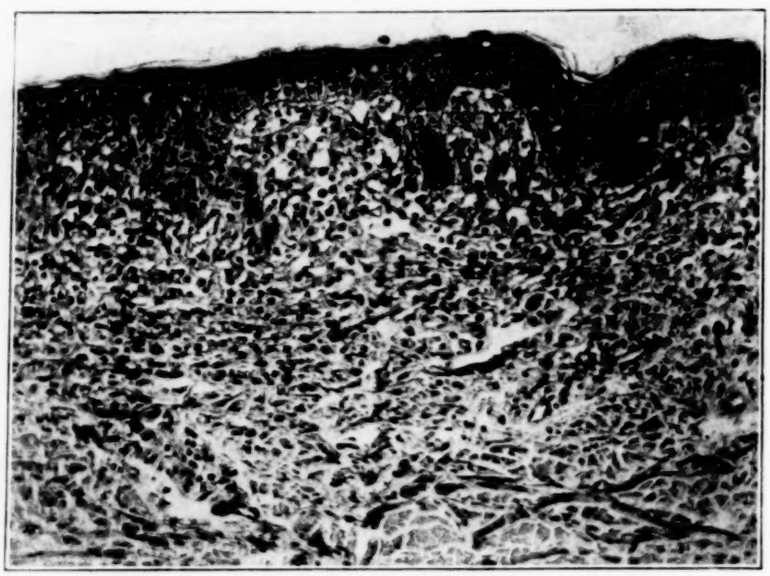

Fig. 4.—Microscopic section of papule (high power), showing edema of epidermis, subepidermal vesiculation, edema of corium, infiltration of round cells in upper part of corium, areas of collagenous degeneration and perivascular infiltration.

The rete pegs were flattened and distorted by the subjacent edematous changes in the corium. A few mitotic figures were seen here and there. Wandering cells in the epidermis were not observed, nor were pigment granules.

In the pars papillaris an advanced grade of edema of the papillary bodies was present. The papillae were flattened and disorganized, their summits being displaced by a reticulum of vacuoles and small vesicles, separating them from the overlying epidermis, and resulting in an edematous meshwork which involved the papillary and subpapillary portions of the corium to a high degree. The blood vessels and lymphatics were increased and markedly dilated, the vascular endothelial lining being distinctly swollen. A moderate perivascular infiltration of small round cells was present in the papillary bodies; deeper down, the infiltration was more pronounced, the cells being more numerous and closely packed about the vessels and lymph spaces; the cell masses appeared in elongated bands as well as scattered aggregations, independent of vessels. The infiltration, taken as a whole, was rather well defined at its lower boundary. The elements consisted almost wholly of small round cells with well stained nuclei, together with a small number of fibroblasts. Plasma cells and mast cells, as also pigment granules, were not observed. The collagenous tissue of the pars papillaris was degenerated, most of it being edematous and granular in appearance. The section contained a hair follicle, surrounded by a sleeve of infiltrating cells and a few fibroblasts. The pars reticularis presented a moderate grade of edema, with, here and there, areas of granular degeneration of the collagen. The coil glands, arrectores muscles, and blood vessels all presented evidences of degeneration, the walls of the vessels being markedly increased in thickness. The elastic tissue was diminished and somewhat fragmented in the upper corium, but lower down it appeared to be unaffected.

SUMMARY

As has been stated, the eruption exhibited by this patient so closely resembled a widespread lichen planus that a number of eminent dermatologists even after careful scrutiny, held the opinion that it was, indeed, an unusual example of that dermatosis. The localization and distribution of the lesions, their color, consistence, burnished surface, configuration, occasional grouping and linear arrangement, together with the fact that the patient complained of considerable itching of the affected skin, were determining factors in the diagnosis. There were, however, certain points of departure from the typical picture presented by a disseminated eruption of lichen planus. The papules, instead of being predominantly polygonal, were for the most part oval and round in outline; umbilication was seen in only a small proportion of the lesions, most of them presenting a smooth, glistening surface, without a trace of delling; the fine, whitish, adherent linear scaling—Wickham's striae—so characteristic of lichen planus papules, was lacking. Finally, the absence of lingual and buccal mucous membrane lesions, in a case presenting an eruption so extensive in its distribution, contributed an added element of doubt to the diagnosis of lichen planus. (In Werther's case, however, the buccal mucosae were affected by the disease.)

From the histologic standpoint, the minute structure was seen at a glance to be quite different from the characteristic picture of lichen planus, and to conform to that which, when correlated with the clinical appearances, left no other diagnosis open for consideration than that of parapsoriasis. It is well known that the

microscopic changes in this group of affections is by no means pathognomonic, in the same sense that the histopathology of lichen planus is pathognomonic, for the various pathologic alterations peculiar to parapsoriasis may also obtain in many other cutaneous diseases, or may at least play a minor part in the general morbid process of other dermatoses. A diagnosis of parapsoriasis based on the microscopic findings alone is considered to be, as pointed out by Arndt, a rather uncertain procedure, and should be made with circumspection. Such a diagnosis is fully justified, however, when the clinical and histologic data are considered side by side and are correlated to one another, as was done in the present instance.

24 West Fifty-Ninth Street.

ABSTRACT OF DISCUSSION

DR. OLIVER S. ORMSBY, Chicago: I have seen a number of these cases and think the classification of Brocq is correct from a clinical standpoint. We see cases with small lesions and others of the large, flat variety, and while it seems rather odd that lesions apparently so different should be classed together, yet, as Dr. Wise pointed out, they are histologically the same. In one of my cases three distinct classes of lesions were present. They are very difficult to clear up. Occasionally a patient gets well. We had such a case. That patient had a parapsoriasis and the lesions cleared up within two days after the use of salvarsan. In another case treated with chrysarobin which Dr. Schamberg furnished the lesions cleared up almost entirely; then the patient disappeared for some time and when he came back the lesions had recurred, but he gave a history of having had the eruption a number of years and that he had never received any benefit from any treatment except the chrysarobin.

TRAUMATIC PULSATING EXOPHTHALMOS *

WILLIAM ZENTMAYER, M.D.
PHILADELPHIA

Although comparatively a rare condition, traumatic pulsating exophthalmos is of so serious and distressing a nature that the report of additional cases in which operation was performed cannot but be of interest and value. Notwithstanding that after a thorough study and analysis of the surgical procedures and therapeutic measures employed in the cases reported in literature and in their own practices, prior to July 1907, de Schweinitz and Holloway[1] were of the opinion that in view of the uniformly successful results attending operations on the superior ophthalmic vein "it would seem that this procedure should be considered before ligation of the carotid, and certainly should precede ligation of the second carotid provided the first operation has failed to produce the desired result," a review of the literature that has appeared since this was written shows that for the alleviation of the symptoms of the traumatic type, at least, the operation earlier introduced, ligation of the common carotid, is the one still usually performed.

There can be little doubt that in the majority of cases of traumatic origin the lesion is a rupture of the internal carotid in the cavernous sinus, and that the dilatation of the ophthalmic veins and of the nasofrontal and angular veins is the result of the venous stasis thus created. It therefore seems logical to seek to prevent the stasis rather than to remove the end-result, and this has no doubt been the thought of those who have preferred to operate on the vessels of the neck. Another reason why others have been deterred from operating on the ophthalmic vein is that temporary unfavorable symptoms developed in three of the seven cases, reports of which were collected by de Schweinitz and Holloway, and that there has since been one fatal result[2] or they have foreseen the danger of thrombosis of the basal sinuses, the possibility of which was emphasized by these authors. Another reason that the orbital operation has not more often been performed has doubtless been that, owing to the gravity of the condition, the general surgeon has been usually consulted, and the topography of the triangles of the neck is more familiar to him than is that of the region preempted by the ophthalmic surgeon.

Following are the notes of my own cases:

CASE 1.—While A. M., Italian, aged 26 years, admitted to Wills Hospital, March 27, 1906, was seated at home, Nov. 21, 1905, the left eye suddenly bulged forward accompanied by a noise in the temporal region and in the left ear. About one month before this date, while assisting three other men to carry a heavy beam, he severely strained himself in an effort to hold it after the others had let go their hold. Two weeks later he began to suffer from headaches. There had been little change in the appearance of the eye since it became prominent. There was nothing in either the personal or family history bearing on the present condition.

L. E. proptosed 8 mm. straight forward. All movements are abolished except inward and downward, both of which are restricted. There is congestion of the lids and of the conjunctiva. There is neither orbital venous tumor nor pulsation. Faint bruit. Pupil 5 mm. in diameter; prompt to light. V. R. E. 6/6; L. E. 6/30.

The ophthalmoscope shows: R. E. Numerous retinal hemorrhages. Veins engorged. Papilla swollen. L. E. Small striated hemorrhages at the upper margin of the papilla. Veins engorged and retina hazy.

Otologic, rhinologic and neurologic examination negative.

May 1, 1906, the left common carotid was ligated by Dr. G. G. Davis. There were no cerebral symptoms, and the patient was discharged ten days after the operation. At that time the neuritis in the right eye had increased, and the veins were very much engorged. There was no change in the proptosis or in the movements of the globe. No subjective bruit.

One month after the operation the proptosis and movements of the globe remained unchanged, and there was no return of the bruit. In the right eye the neuritis had almost subsided. V. R. E. 6/6; L. E. 6/30.

CASE 2.—D. L., American, aged 21, miner, admitted to Wills Hospital, Jan. 15, 1916, was struck in the right occipital region by a mine car, July 7, 1915. He remained unconscious for 5 days. No operation was performed. On regaining consciousness the right eye was prominent and there was a buzzing noise in the right ear "which kept time with his heart." There was no diplopia, headache or pain. The left side of the face was paralyzed. There had been amnesia lasting about one month. For the facial paralysis he had vibratory massage and electricity, and to this he attributes the improvement that has taken place in this symptom. The left eye has been at no time involved.

R. E. Proptosed 10 mm. The superior orbital sulcus is pushed forward by a soft mass in the orbit above the globe; ordinarily more prominent to the temporal side, but when the lids are closed more marked, especially to the nasal side, and a thrill can then be detected over the mass. There is a loud swishing bruit synchronous with the heart systole. The bruit

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. De Schweinitz and Holloway: Pulsating Exophthalmos, Philadelphia, W. B. Saunders Co., 1908.

2. Mentioned by de Schweinitz in discussions of Wilder's paper (Footnote 9).

can also be heard over the carotid near the angle of the jaw, and also over the temporal bone and inferior orbital margin. Pressure on the carotid causes both the objective and subjective noises entirely to disappear. The bulbar conjunctival vessels are greatly distended, one large vessel extending from canthus to canthus. The external rectus muscle is paralyzed. The right pupil is 3.5 mm. and prompt to light; L. pupil 2.5 mm. and prompt to light. R. E. 20/20; L. E. 20/15. Ophthalmoscopic examination: R. E. Veins and arteries enlarged and somewhat tortuous, more particularly in the nasal branches. The venous blood current is very dark.

The patient was transferred to the Pennsylvania Hospital under the care of Dr. G. S. Crampton, where he was further studied with a view of determining the proper surgical procedure. Dr. Crampton has kindly supplied the following notes: Roentgenoscopy revealed no evidence of a fracture of the skull nor any evidence of any bone change, as, for instance, from pressure of an aneurysm. Neurologic examination: Slight fine tremor of hands. Hands are clammy and show slight capillary stasis. Knee jerks apparently exaggerated. Plantar reflex active. No Babinski or ankle clonus. Slight Graefe lid sign on left side. Distinct weakness of the muscles of the left face involving both upper and lower branches of the seventh nerve. The tongue, however, is protruded straight and the eye can be closed. Definite loss of taste to sugar and salt on anterior two thirds of tongue. Auditory nerves are equally active on both sides. Urinalysis: Specific gravity 1.023. No albumin, sugar or casts.

Digital pressure was made on the right carotid for fifteen minutes at a time to accustom the patient to diminished cerebral blood supply. This caused a tingling sensation in the hands, and the proptosis diminished slightly.

February 23, Dr. Francis T. Stewart ligated the right common carotid. A ¾ inch ribbon of fascia lata ⅛ inch thick was passed around the artery as a collar and tightened with silk sutures until a definite thrill could be felt in the vessel, and the temporal pulse had disappeared. A single turn of a silk ligature was made around the fascia, and the long ends were tucked in the wound for use in tightening the ligature later. At the end of the operation the temporal pulse was not palpable, but the bruit in the temporal region could still be heard in diminished degree. No thrill over the globe. Next day the fundus showed no change. February 29, stitches removed. A catgut ligature was fastened to the old silk ligature and pulled through. Complete ligation was done. For about one minute after ligation the temporal pulse on the right side could not be felt, but after that it reappeared, but quite small, as though collateral circulation had been established.

March 3, the eye looked remarkably better. Only slight proptosis and no thrill or bruit. The patient was discharged March 8. There was a slight increase in the proptosis, and pulsation could again be felt in the internal angular vein, when compression was made below. March 13, the patient returned to the hospital with edema of the extremities, right chest and abdomen. Urine: Specific gravity 1.030. Cloud of albumin. Granular and hyalin casts. No sugar.

March 24, proptosis fully as marked as before operation. Some edema of the conjunctiva and corneal haze. Retinal veins no longer engorged or tortuous. Papilla slightly pale. No fundus lesions. Bulbar movements full except limitation of outward excursion. Pupil normal. No subjective noise. No thrill. Bruit faint and confined to the orbital region.

March 28, patient still confined to bed with nephritis.

Fig. 1.—(Case 1).—Traumatic pulsating exophthalmos.

The following brief notes of a case of spontaneous pulsating exophthalmos reported by Dr. Frederick Krauss are added because the case illustrates one of the dangers of ligation of the orbital veins and because of the method of operating.

F., aged 59 years. No history of trauma. Family history negative. Pronounced right sided exophthalmos with a loud bruit heard over the face, loudest over the anterior portion of the temporal bone. No ocular pulsation. V. 5/15. Wassermann negative. Blood pressure: Systolic 215 mm. Under internal medication and carotid compression gradual subsidence of the symptoms took place for a time, but this was followed by sudden severe pain in the right eye followed by intense proptosis and very pronounced pulsation. The left eye also became markedly proptosed. Pressure on the right carotid caused a disappearance of the subjective and objective noises, but had no effect on the exophthalmos. The movements of the right eye were abolished. A large pulsating vessel was found on the nasal side of the eye ball within the orbit. There was enormous dilatation of the retinal veins with retinal and choroidal hemorrhages and a low grade uveitis.

Operation: An incision was made directly over the eyebrow from the outer orbital line to the root of the nose and then curving down to the canthus. The periosteum was separated from the orbit, dislocating the contents of the orbit within its folds. The pulsating vessel being readily felt, an incision was made near it through the periosteum, disclosing enormously dilated vessels throughout. A pedicle needle with a catgut ligature was passed around the largest pulsating vessel and tied. The pulsation and subjective bruit ceased. Several weeks later, pulsation returned near the upper-inner orbital margin, where a small sinus remained. Deep massage three weeks after the operation caused a tremendous hemorrhage, which was immediately controlled by pressure against the bony orbit. Several days later there was a spontaneous recurrence of the bleeding for which, an assistant failing to control, the common carotid was tied with the result of causing a cessation of pulsation and an immediate healing of the sinus. Four weeks later the proptosis was still pronounced and there was a return of intermittent pulsation.

Krauss states that he is convinced that in tying off the orbital vessels more than one strong ligature should be used.

The reference in literature to pulsating exophthalmos were brought down to the year 1907 by de Schweinitz and Holloway, and Bedell[3] in 1914 gave an abstract of the cases of traumatic origin that he was able to find in the literature covering the period between the foregoing dates. Following are, in abstract, additional cases of traumatic form reported during the foregoing period, and cases since reported. The brief abstracts of the first six cases are taken from an inaugural dissertation by Johannes Eysen.[4]

Reported by Wagenmann (1900). Shot in the right temple. R. E. exophthalmos. Pulsation. Bruit. Paralysis of the external rectus and of the oculomotor nerve. Ptosis. Distention and tortuosity of the conjunctival vessels. L. E. proptosis and pulsation. Compression of carotid without

3. Bedell: Arch. Ophth., 1915, xliv, No. 2.
4. Eysen, Johannes: Inaug. Diss., Berlin, 1908.

result. Ligation of the right common carotid. Transient effect. One year after operation R. exophthalmos very marked. Cornea hazy. Blind.

Reported by Nettleship (1901). Bilateral typical pulsating exophthalmos following injury. Ligature of common carotid. Cure. Optic nerve atrophy.

Reported by Bossalinow (1901). R. pulsating exophthalmos following fall on the right temple. Potassium iodid. Compression of the carotid. Cure.

Reported by Reuchlin-Schlüpmann (1902). Bilateral exophthalmos following a fall against an iron pillar. Orbital pulsating tumor. Eyes practically immobile. Chemosis. Ptosis. R. pupil sluggish; left normal. Bruit. Compression resulted in improvement. R. common carotid ligated. Cure except for slight abducens paresis.

Reported by Golowin (1903). R. pulsating exophthalmos following a gunshot wound. Central corneal opacity. Anesthesia of conjunctiva and cornea. Optic atrophy. Temporary resection of the outer wall of the orbit. Ligation of the ophthalmic vein. Disappearance of the exophthalmos. During healing, purulent keratitis with hypopyon. Paralysis of inward and outward movements.

Reported by Geiszler (1907). L. pulsating exophthalmos following injury. Bruit. Chemosis. All movements of the eyeball restricted but no paralysis of the abducens. L. pupil smaller than right. V.=5/20. Papilla congested. Retinal veins markedly congested and tortuous. Compression of common carotid. Result?

Reported by Thierry[5] (1908). O. D. M., 24. Shot in the right temple. Ball passed through brain and lodged beneath the temporal muscle immediately opposite. Typical symptoms of arteriovenous aneurysm in the cavernous sinus. No treatment. Ligation of common carotid contemplated.

Reported by Bettremieux[6] (1909). O. D. M., 25. Blow on the head. Pulsating exophthalmos developed six months after the accident. Objective and subjective bruit; the latter like a jet of escaping steam. V.=1/3. Papilla congested. Retinal arteries slightly contracted. Veins dilated. Compression of carotid; diminished bruit and pressure on the angular vein at the upper-inner margin of the orbit completely arrested it. Diagnosis, arterial compression at the apex of the orbit or a small arterial aneurysm in same situation. He believes that the arrest of the bruit by pressure on the orbital vein excludes arteriovenous aneurysm. He thinks that this phenomenon is perhaps more common than is supposed.

Fig. 2 (Case 1).—Traumatic pulsating exophthalmos.

Reported by Natanson[7] (1909). Bilateral. M. Blow on head. Extensive ectasia of the superior ophthalmic vein at the upper inner orbital margin of both orbits. Cyanosis of the area of the anterior facial vein due to anastomosis with the superior ophthalmic vein. Bruit synchronous with systole of heart. Patient would not submit to operation. Diagnosis, arteriovenous aneurysm with rupture of the internal carotid in the cavernous sinus.

Reported by Dodd[8] (1911). O. D. M. Patient slugged and rendered unconscious. Following day facial palsy. Panophthalmitis developed. Eye enucleated. Swelling of the conjunctiva continued two weeks, when proptosis of the right eye with distinct bruit developed. Ligation of right common carotid. Complete cure.

Reported by Wilder[9] (1911). R. E. M., 42. Rendered unconscious by a blow over the right eye. On recovery, severe pain, roaring in right ear, diplopia. Right eye began to protrude. Marked distention of the angular veins at the superior border of the orbit. Only slight abduction preserved. Marked bruit most intense with carotid systole over right side of head and eye; also at times faintly on the left side. Roaring tinnitus. No pulsation of orbital contents. On compression of carotid, bruit and subjective noise ceased. Diagnosis, aneurysm of the intracranial portion of the internal carotid. Right common carotid tied. Bruit objective and subjective ceased at once. Exophthalmos and pain gradually subsided, and movements of globe gradually restored. In five weeks, vision had risen from 20/60 to 20/30. Revised diagnosis, aneurysm of the cavernous portion of the carotid which did not communicate directly with the sinus.

Reported by Wilder[9] (1911). R. E. M., 38. Fracture in parieto-occipital region, with insertion of a silver plate five or six months before exophthalmos developed. Three months later struck in back of head with iron bar and rendered unconscious. After seven weeks, right eye protruded, followed in three weeks by pain and watering of eye. Marked proptosis; eye divergent; pupil immobile and dilated. T. +. Pain in right side of head. High pitched bruit heard all over head synchronous with heart beat. V.=20/40. Retinal vessels distended. Ligation of right common carotid. Bruit ceased at once; exophthalmos diminished. Almost complete recovery from third nerve palsy. Nine weeks later, return of subjective bruit, and still later of the objective bruit. Four months after operation, increase in exophthalmos. Internal carotid and facial vein tied. Three days after operation complete paralysis of the left forearm and hand with difficulty in speech. No amnesia. When last seen, still some muscular weakness; exophthalmos very slight; motility good; veins less prominent. V.=20/50.

Reported by Ipsen[10] (1912). O. D. M. Severe injury to head. Two months later, typical pulsating exophthalmos. Intense pain in the head. Bruit. Intra-ocular tension with Schiötz 45 mm. Retinal vessels dilated. Ligation of common carotid. Cure.

Reported by Balbuena[11] (1913). O. S. Male. Shot in the middle of the forehead. Same day loss of vision, proptosis of eyeball and lids. Pulsation synchronous with radial pulse. Bruit marked at the upper-inner angle of orbit. Papilla atrophic. Diagnosis, aneurysm in orbital vessels anterior to sphenoid fissure. Twenty-one subcutaneous injections of 4 per cent. gelatin without improvement. Six intravenous injections at intervals of from eight to ten days effected a cure.

Reported by Feruglio[12] (1913). O. S. Male. Injury at the internal third of left lower lid, resulting in exophthalmos, headache, vomiting. Vision normal, but cerebral symptoms recurred. Pulsation of globe synchronous with arterial pulse. Loud murmur over closed lids and cranium. Slight hyperemia and edema of retina. Left common carotid tied, causing reduction of exophthalmos and restoration of movements of globe. Fifteen days later, return of symptoms. Right common carotid tied without result. Author emphasizes importance of a centrifugal venous pulse in establishing the diagnosis of arteriovenous aneurysm in a case of exophthalmos.

5. Thierry: Rec. d'opht., October, 1908, p. 469.
6. Bettremieux: Ann. d'ocul., Brussels, 1909, cxlii, 33.
7. Natanson: Ztschr. f. Augenh., 1909, xxii, 81.
8. Dodd: Tr. Chicago Ophth. Soc., March 20, 1911.
9. Wilder: Tr. Am. Ophth. Soc., 1911, xii, 832.
10. Ipsen: Hospitalstidende, Sept. 11, 1912.
11. Balbuena: Arch. de oftal., 1913, xiii, 72.
12. Feruglio: Ann. di Ottal., Pavia, 1913, xliii, 287.

Reported by Rubel[13] (1913). O. S. Male. After a blow on the head there was loss of vision in O. S., and deafness on both sides. Three and a half years later, typical left sided pulsating exophthalmos. Papilla atrophic. Retinal veins dilated. Arteries normal. No edema of the retina, but numerous bright to light yellow dots extending to the extreme periphery of the fundus. The veins were in places obscured. Ligation of the common carotid. Eight and one half months later, the spots had disappeared. They were the result of venous congestion, but their nature was not determined. Result improved.

Reported by Märtens[14] (1913). Unilateral pulsating exophthalmos three months after gunshot wound of temple. Roentgenoscopy revealed four shots within the cranium, one of which was in the cavernous sinus. No further details.

Reported by Sym and Miles[15] (1914). O. S. Male, 46. Thrown from a trap on the crown of his head. Symptoms of fracture of the middle fossa of the base of skull. On regaining consciousness, had buzzing in both ears. A few days later, rapid development of pulsating exophthalmos of right eye. Blood oozing from conjunctival points. Failure to control hemorrhage led to enucleation of the eye. Eight weeks later, fellow eye began to proptose. V. = 6/18. Retinal veins congested. Globe almost fixed; small degree of lateral movements. Blowing murmur over eye and temple synchronous with heart. Diagnosis, traumatic arteriovenous aneurysm on the right side, pressure telling back on circular sinus of left side. Right common carotid tied. Immediate cessation of buzzing. Three weeks after operation, V. = 6/6. Full rotation of the globe. No exophthalmos. No subjective symptoms. Five months later, complete recovery.

Reported by Weil[16] (1914). M. O. S. Thrown from bicycle, striking left side of head. Rapid development of typical aneurysm in the cavernous sinus. Paralysis of abducens and accommodation. V. normal. Marked engorgement of the anterior ciliary veins and of the vessels of the papilla. One month after accident, left common carotid tied with only slight benefit. The exophthalmos only slightly improved—in five weeks, 2 mm. out of 5 mm.

Reported by Bedell[17] (1914). Bilateral. M., 39. Thrown from car, striking head against a tree. Fracture of base. Dizziness and headache followed appearance of orbital mass having pulsation and bruit. Symptoms of pulsating exophthalmos. Outward movement of globe limited. Retinal vessels overfull. No visible pulsation of globe. V. = 2/730. Left eye, large mass of tortuous dilated blood vessels in upper lid. A large vessel at upper-inner angle of the orbit. Abducent paralysis. Bruit and blowing murmur heard over supra-orbital ridge and entire head. Retinal veins engorged. Occasional pulsation of the retinal arteries. Hearing on left side much reduced. Roentgenoscopy revealed separation through the frontal bone, extending from deep in the orbit to the vertex between the parietals. Carotid pressure, or pressure on the ophthalmic vein deep in the left orbit, stops pulsation and bruit. Patient refused operation.

Reported, in discussion, by Oertel[17] (1914). Bilateral. M., 39. Fracture of the base of the skull. Two days later proptosis of left eye and one month later of the right eye. Intense pain. Pupils dilated, globes fixed. Distinct pulsation of both globes. Small pulsating vessel extended across the bridge of the nose. V. = fingers at 2 feet. Under administration of potassium iodid, sedatives and local scarification, return to normal in two and a half months. Author strongly advises conservative treatment.

Reported by Silvan[18] (1914). O. D. M., 16. Fall on head. Typical pulsating exophthalmos. Globe immobile, pupil dilated. Paralyses of left facial. Preservation of the function of the eighth, ninth, tenth, eleventh and twelfth nerves. Papilla over capillary, veins turgid. V. = 1. p. Pulsation and bruit. Ligation of right common carotid. Marked reduction in exophthalmos. V. = 2/3.

13. Rubel: Klin. Monatsbl. f. Augenh., July, 1913, p. 62.
14. Märtens: Klin. Monatsbl. f. Augenh., 1913, p. 523.
15. Sym and Miles: Edinburgh Med. Jour., 1914, xiii, No. 5.
16. Weil: Klin. Monatsbl. f. Augenh., January, 1914, p. 119.
17. Oertel: Tr. Acad. Ophth., Boston, October, 1914.
18. Silvan: Riv. ven. d. sc. med., 1914, lxi, 51.

Reported by Cantonnet[19] (1914). O. D. Soldier. Severe hemorrhage of the internal maxillary artery. Seven months later exophthalmos, varicose veins in lids. Pulsatile tumor. Mechanical ptosis. Only slight adduction remaining. Retinal veins and arteries show pulsation. Arteries contracted, veins dilated. Papilla pale. Eye blind. To be treated with gelatin injection.

Reported by Posey[20] (1915). Bilateral. M., 66. Fall on head with fracture of skull. Vision began to fail shortly after the accident. Roentgenoscopy three years after accident, negative. Mass of veins, which pulsate and convey a thrill on palpation, felt under upper rim of orbits. O. D. V. = fingers at 12 inches; O. S. 1/60. Low grade optic atrophy. Retinal veins much distended and tortuous. Eyes nearly immobile. Also symptoms indicating cerebellar involvement from a destructive lesion occasioned at the time of accident. Rapid disappearance of symptoms after ligation of right common carotid and resection of the orbital veins. V. =. O. D. 1/60; O. S. 6/60.

Reported by Ruata[21] (1915). O. D. M., 16. Six months after the accident, marked exophthalmos with pulsation synchronous with radial. Visible pulsation. Pressure on the carotid diminishes the exophthalmos. Movements of the globe full. Pupil dilated and fixed. V. = 1. p. Papilla over capillary and margins diffuse. Veins extraordinarily tortuous and engorged. Arteries reduced, pallid and fusiform. Paralysis of the left facial with lagophthalmus. Retinal veins dilated and tortuous. V. = 0.4. Small temporal field. Ligation of the right common carotid. Result, exophthalmos and venous engorgement of orbit persisted. White plaque appeared between papilla and macula. O. S. Lagophthalmus persisted. Eye otherwise normal. V. and field normal. Final result, exophthalmos lessened. V. = 001.

Reported by Brazeau[22] (1915). Unilateral. O. S. M., 3[illegible]. Blow on left side of face four years previously. Two days after injury, roaring noise preventing sleep. Three months later, proptosis, dizziness and diplopia. Enlargement of supra-orbital veins. Paresis of external rectus. V. = counting fingers. Distinct bruit over eyeball. Retinal vessels markedly dilated. Optic neuritis. Neff clamp applied to the common carotid. Pulsation and bruit disappeared in four days. Six months later, still some exophthalmos. V. = 6/[illegible]. Final result two years later, V. = 8/10. All phenomena disappeared, and there were no untoward cerebral symptoms. The author considers that this procedure meets the requirements of occlusion, for it prevents danger of secondary hemorrhage which attends sudden stoppage of blood current, and prevents cerebral ischemia and late cerebral softening, resulting in 50 per cent. in death. It also shortens the period of recovery; in this particular case the patient returned to work within thirty days of the operation, and two years later there were no untoward results.

Reported by de Schweinitz and Holloway[23] (1916). O. S. M. Fracture of skull from motorcycle accident. On regaining consciousness patient noted that the vision of O. S. was affected. One week after accident, left temporal decompression was done. Five days later some exophthalmos; limitation in all rotations of the globe except downward. Temporal half of papilla pale, retinal veins full-sized. Fingers at 1 m. Hand field full. One year later all the symptoms of pulsating exophthalmos. At upper-inner region of orbital margin, large venous ectasia with thrill and pulsation. Smaller one in lower lid. Disseminated retinal hemorrhages. Veins full and tortuous. Rotations of globe full except for slight limitation of outward rotation. V. = 6/22. A precautionary ligature was thrown about the carotid but not tied previous to cutting down on the orbital ectasia. The dilated vein was ligated and excised. Two months later there was return of pain and pulsation on deep pressure in the inner-upper portion of the orbit. Displacement of globe same as before the operation. On lying down there was an intermittent bruit de piaulement.

19. Cantonnet: Arch. d'opht., 1914, xxxiv, 583.
20. Posey: Ann. Ophth., 1915, xxiv, 203.
21. Ruata: Arch. di Ottal., Pavia, 1915, xxii, 307.
22. Brazeau: California State Jour. Med., 1915, xiii, 307.
23. Tr. College of Phys. of Philadelphia, January, 1916.

SUMMARY AND CONCLUSIONS

An analysis of the twenty-nine cases collected in this paper shows that:

The common carotid was ligated sixteen times, resulting in a cure in seven, improvement in five and failure in four.

Combined ligation of the common carotid and the ophthalmic vein was done once, resulting in a cure.

Combined ligation of the internal carotid and the facial vein was done once, resulting in a cure.

Ligation of the orbital veins was done once, resulting in slight improvement.

Slow ligation of the carotid was done twice, resulting in one cure and one slight improvement.

Ligation of both carotids was done once, resulting in failure.

Compression of the carotid and internal treatment was followed in four cases, resulting in cure in two, improvement in one, and result unknown in one.

Gelatin injections were used in one case, resulting in a cure.

There was no treatment in six cases.

Combining these cases with those analyzed in Bedell's paper,[3] we find that the common carotid artery was tied thirty-two times with cure in twelve, or 37.5 per cent., improvement in twelve, or 37.5 per cent., and failure in eight, or 25 per cent.

The orbital operation, ligation of the ophthalmic vein, was done in six cases (including the case mentioned by de Schweinitz in discussion), with cure in three, or 50 per cent., improvement in one, or 16 per cent., and failure in two (one fatality), or 33 per cent.

Gelatin injections were used in four cases with cure in two, or 50 per cent., improvement in one, or 25 per cent., and failure in one, or 25 per cent.

It is to be particularly noted that in this combined series there are thirty-two cases of ligation of the common carotid without a fatality. Just how frequently late cerebral softening results, it is difficult to say; but if this complication can be averted, as is claimed, by slow ligation, it would seem that inasmuch as death may result from simple ligation of the ophthalmic vein and that late serious hemorrhage into the orbit necessitating ligation of the carotid artery has occurred, and that finally, in traumatic pulsating exophthalmos the lesion is usually an aneurysm of the internal carotid in the cavernous sinus, the order of surgical procedure indicated is slow ligation of the common carotid, followed by ligation of the ophthalmic vein in those cases in which the primary operation fails to effect a cure.

Inasmuch as the results with gelatin injections have been favorable in the few cases in which they have been tried, there can be no objections to their employment if the patient is seen early.

1819 Spruce Street.

ABSTRACT OF DISCUSSION

DR. FRANK E. BURCH, St. Paul, Minn: One is particularly impressed in this report with the freedom from serious trouble following carotid ligation. There were no fatalities. It would seem that any objections to carotid ligation would be met if preliminary digital or mechanical compression were employed, or if the artery was ligated gradually.

In 1910 Dr. Charles H. Mayo suggested the use of a strip of block tin, which is firm enough to remain set and can be compressed with the fingers. In a case of my own, ligation did not cure, and subsequent resection of the ophthalmic vein gave relief to the patient, although vision in the operated eye was lost.

In my case, as in one of Dr. Zentmayer's, carotid ligation failed to stop the bruit fully and completely, although the subjective and objective symptoms were relieved by each procedure. In Krauss' case the uveitis preceded, in mine it followed, ophthalmic ligation. It is a fact that the bruit persists in a very considerable proportion of the cases reported, treated either by ligation of the carotid or of the ophthalmic vein. I can conceive that preliminary compression of the vein and double ligation without resection might lessen the traumatism and venous stasis and I recommend that this be tried. Dr. de Schweinitz makes a distinction between arterial aneurysm within the cavernous sinus and arteriovenous aneurysm. It is not impossible that some of the reported cases of cure by carotid ligation alone were arterial aneurysms.

DR. W. H. WILDER, Chicago: Concerning the first case of the author, it is difficult to understand how a traumatism so slight as that resulting from strain while lifting, could, in a strong, healthy young man of 26, bring about a condition such as that believed to cause pulsating exophthalmos, without a previous diseased condition of the walls of the carotid artery. It would seem probable that this case belongs to the class of spontaneous exophthalmos. Furthermore, the absence of noticeable pulsation in this case would seem to indicate that the cause might have been an aneurysmal dilatation of the carotid artery in the sinus rather than a true arteriovenous aneurysm with rupture of the artery into the sinus. In such cases the pulsation may be very slight or entirely absent, as in Dr. Zentmayer's first case, although a bruit is obtainable over the orbit and on the side of the head. In 1897 I reported three cases of pulsating exophthalmos to the American Ophthalmological Society, one of which, in a man 39 years of age, was spontaneous, and the only etiology that could be determined was syphilis, which he had contracted fifteen years before. The presumption was that there was an aneurysm of the carotid in the sinus for pulsation was very distinct. Ligation of the carotid was repeatedly refused, as was also digital compression, and antisyphilitic treatment was administered for months with distinct reduction of the swelling. At the end of a year he passed from my observation with the condition still present. It seems to me important in any case in which there has been very slight traumatism or none at all to determine, if possible, the existence of syphilitic infection, for treatment directed toward this may have its effect, in view of the fact that a number of cases are known to have recovered spontaneously. Of the five cases that I have seen and recorded, four were caused by crushing injuries of the skull. Three of these were operated on and relieved: one by ligation of the right common carotid, followed three months later, because of recurrence, by ligation of the left carotid; one by ligation of the right common carotid; one by ligation of the right common carotid followed nine weeks later, because of return of the bruit, by ligation of the internal carotid of the same side.

DR. M. H. LEBENSOHN, Chicago: Dr. Zentmayer would have us believe that ligation of the common carotid is either a very simple or a safe procedure. I want to report a fatal case. About six years ago a man, aged 39, was kicked in the right eye and developed a pulsating exophthalmos shortly afterward. He came to the infirmary four or five days after the injury. Slow pressure for two months and medication gave relief at first. Ultimately it was decided to operate and Dr. Halsted operated, with a fatal result in three days. In another case ligation of the common carotid terminated fatally. So that it is not so simple or safe as Dr. Zentmayer would have us believe.

DR. HAROLD GIFFORD, Omaha: Besides the danger of death from cerebral thrombosis you must also remember the danger of blindness from thrombosis of the retinal vessels. I have seen one case in which after ligation for carcinoma of the tonsil the patient became blind in the eye on that side, with occlusion of the retinal artery. Sometimes we have all these symptoms of pulsating exophthalmos from aneurysmal varix in the neck. I had a case some years ago in which a man was knocked down by blows in the neck region; the

neck became swollen and black. The patient developed symptoms of pulsating exophthalmos which were not so bad that we were tempted to ligate the vessels. He established a sort of tolerance for the symptoms and retained them to a certain extent, so far as I know.

DR. T. B. HOLLOWAY, Philadelphia: I do not think that there is any doubt that cases of true pulsating exophthalmos have occurred spontaneously, and in the majority of these instances it is presupposed that there is some alteration in the artery, either through disease or previous trauma. As far as typical pulsating exophthalmos is concerned, I would not regard a case as such in the absence of a subjective or objective bruit. Probably the most interesting factor that concerns us at present is the treatment—shall we resort to ligation of the carotid or to the so-called orbital operation? Recently Brazeau, in referring to carotid ligation, stated that the method of slow ligation by the use of the Neff clamp will do away with 50 per cent. of deaths in these cases. Carotid ligation in pulsating exophthalmos never has and never will give rise to a 50 per cent. mortality. Ligation may have a mortality of 25 to 40 or even 50 per cent. when considered in reference to the various conditions for which this procedure may be done. If we take Reuchlin's series of 116 cases and the series of 32 cases reviewed by Dr. de Schweinitz and myself, the mortality for these 150 cases is 10 per cent. (fifteen deaths). If we include the thirty-two cases of Bedell and Zentmayer, the mortality is but 8.2 per cent. for 182 cases. If this be compared with Siegrist's mortality of 8.8 per cent. for 113 cases, there is a difference of but .6 per cent., so that I feel that the mortality for carotid ligation is pretty definitely established. Even in double ligation of the carotid, and there are some ten or eleven cases on record, the mortality among 303 cases was only 20 per cent. In our own series we found that the orbital veins had been ligated without fatality eight times. The series of six cases quoted by Dr. Zentmayer, if added to ours, gives a total of fourteen cases with one death. I admit the series is small but the mortality is only 7.1 per cent. If we include the other four cases of orbital operation referred to in our series, the mortality is still less, but 5.5 per cent. Much is said about the possible cerebral complications that may follow ligation of the orbital vessels. Cerebral complications also occur after carotid ligation, and I question whether the statistics are as accurate as those for ligation of the orbital veins. As far as we can tell, about 9 per cent. of the cases subjected to carotid ligation have been followed by cerebral complications. I am free to admit that slow ligation as advocated by Brazeau, Matas and others tends to eliminate certain prominent complications, such as secondary hemorrhage and possibly wound infection. In other words, if I had a pulsating exophthalmos today I would possibly want the common carotid ligated by gradual compression. I would insist on a ligation of the orbital vein before resorting to ligation of the other carotid. On the other hand, it must not be forgotten that in this condition much depends on the extent of the primary injury, the age of the patient, the presence and character of possible associated diseases. All are factors when it comes to selective treatment.

DR. WILLIAM ZENTMAYER, Philadelphia: There is no doubt that the case mentioned by Dr. Wilder is open to such criticism as he has made. That patient was seen before Wassermann tests were made, and the only way we could get the history was by interrogation, which is unsatisfactory in regard to syphilis. There may have been syphilitic disease of the artery as the underlying cause. I hope I did not leave the impression that ligation is a harmless procedure. I said there had been no fatalities in the cases I collected. If you will consult the monograph of Drs. Holloway and de Schweinitz you will find that there have been many fatalities, but I made the point that by the new method of ligating the carotid this might be avoided. I have been asked how this has been accomplished. There have been many plans. Matas uses aluminum plates which are slowly approximated until final occlusion. In my own case Dr. Stewart used fascia lata, with the expectation that the shrinking of this tissue would bring about slow occlusion of the vessel. I believe it was not altogether successful. He subsequently reopened the wound and brought about the occlusion more rapidly. Another way is by the so-called Neff clamps in which the aluminum clamps are hinged and are gradually approached until occlusion is brought about.

SOME TECHNICAL FEATURES OF LAMINECTOMY FOR SPINAL DISEASE AND INJURY

BASED ON ONE HUNDRED AND FIFTY SPINAL OPERATIONS *

CHARLES A. ELSBERG, M.D.
NEW YORK

In our operations for spinal disease or injury, we have used different methods of approach (curved and straight incisions, hemilaminectomy and complete laminectomy) and various instruments, and I have arrived at the conclusion that the complete removal of the spinous processes and laminae is the simplest and most reliable method for the opening of the spinal canal. Complicated instruments are unnecessary. After the exposure of the spines and laminae by a straight incision and the separation of the muscles, the spines are removed at their bases with large rongeur forceps, and the laminae are bitten away with smaller rongeurs of various sizes and patterns. For the exploration of the spinal canal, a defect at least 1 cm. in width should be made, so that all sides of the cord can be investigated with the minimum amount of handling of the delicate cord tissues. If posterior roots are to be divided, the opening may be somewhat narrower than that for exploration; for decompressive purposes the opening should be at least 1.5 and usually 2 cm. in width (Figs. 1, 2 and 3).

Our experience has shown us that, unless the cord has been invaded (as in incision of the cord for the extrusion of intramedullary growths) marked exaggeration of the symptoms of a spinal disease should rarely follow a laminectomy. The exaggeration of symptoms is usually due to trauma to the cord from too much or too rough manipulation or from hemorrhage into the sac of the arachnoid. As our experience in spinal surgery increased, we found that a more than very temporary exaggeration of the symptoms for which the operation was performed became correspondingly less frequent. While all parts of the cord are very sensitive, the conus and origin of the nerves of the cauda equina are especially vulnerable, and after operations in this region, disturbances of the bladder and rectum and of the lower extremities are especially apt to occur.

DECOMPRESSIVE LAMINECTOMY

The benefits from spinal decompression in non-removable expanding lesions within the spinal canal (tumors, etc.), and in compression of the cord by diseased or dislocated bone, are fully as great as those from cerebral decompression in intracranial disease. The opening in the spinal canal should always be a wide one, so as to give plenty of space.

When a decompressive laminectomy for old or recent fracture of the spine is performed, the surgeon

* From the Surgical Services of the New York Neurological Institute and Mount Sinai Hospital.

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must be sure to take away a sufficient number of spines and laminae. To remove the arches of the fractured or dislocated vertebrae so as to relieve the compressed cord, or to allow the angulated cord to bulge backward, is not enough. It is usually necessary to take away one or two arches above and below, so that the dural sac has sufficient room to bend backward in a gradual curve. In some cases of spondylitis, in which the intervertebral foramina are diminished in size so that the spinal nerve roots are compressed, it may be necessary to enlarge some of the intervertebral foramina with small rongeurs. In one instance I was able, by this procedure, to free several nerve roots from pressure, and thus relieve the patient of a severe root pain.

Fig. 1.—The amount of bone removed in the operation of laminectomy.

It is often advisable to cut a few slips of the dentate ligament at the affected level of the cord, so as to give the cord a greater freedom of movement. The division of a number of slips of the dentate ligament near their attachment to the dura does absolutely no harm, and will always allow a backward dislocation of the cord. Whenever a disease on the anterior surface of the cord (such as a growth) has to be exposed, the manipulations are made more easy by the division on each side of one or two slips of the dentate ligament. When the decompressive laminectomy is performed on account of disease of the dura, it may be necessary to excise a large piece of that membrane. This excision may have to extend on both sides down to and into the dural openings. Such a wide excision of the dura may be required in cases in which the root pains have been very severe. If the disease is confined to the outer surface of the dura, it may be possible to dissect off and excise the thick outer layer of the membrane. If this cannot be done, the dura must either be incised and left wide open, or the diseased part is excised. If the dura is left open, the cord should be covered by a piece of Cargile membrane, and the muscles and fasciae should be united with extreme care.

THE NORMAL AND PATHOLOGIC APPEARANCE OF THE CORD

Considerable experience is necessary before slight abnormalities of the brain tissue can be recognized as such. The same difficulties are encountered in spinal disease; in fact, we have as yet a very limited knowledge of the intravitam macroscopic appearance of the spinal cord in a number of its diseases. I have made notes of the appearance of the cord and nerve roots in my spinal operations, and shall give an account of some of the pictures observed. The surgeon who does much spinal work should not only be able to recognize such gross abnormalities as tumors, pachymeningitis, etc., but he should also understand the finer changes that occur in spinal disease.

THE COLOR OF THE SPINAL CORD AND NERVE ROOTS

Normally the spinal cord and nerve roots are of a creamy white color, and the vessels on the posterior surface of the cord are fairly prominent and somewhat tortuous. The spinal cord in childhood is slightly more yellow, while in advanced age, its color is a more pure white.

While slight individual variations occur, a dead white of the cord is an evidence of medullary atrophy. In multiple sclerosis, it is often possible to recognize the location of a sclerotic patch by the whiteness of the cord at the affected level. A similar pallor of the tissue can sometimes be observed at or below the level of an old injury of the cord. Below an old transverse lesion, the cord is usually of a deeper yellow tint than normally, and I have observed the same yellowish color in transverse myelitis following the puerperium and in pernicious anemia.

The white cords are often flat, shrunken and irregular in consistency. They are sometimes so thin that they float on the cerebrospinal fluid, and undergo undulatory movements with the respiratory waves of the cerebrospinal fluid.

The spinal cord may appear congested in intramedullary disease (myelitis, acute softening), in meningitis, in disease of the dura or arachnoid, below the level of an extramedullary compression, or after a trauma It is very important for the surgeon to have a clear idea of the differences in the appearance of a congested cord due to inflammatory disease and a cord in which the veins are distended following a compression above the level exposed. The inflamed or hyperemic cord has a pink color due to the dilatation of all the vessels in the pia-arachnoid. When the cord is compressed at some higher level, however (especially in spinal tumors) the return flow in the veins is interfered with, so that the veins stand out prominently as dark, tortuous vessels on the normal white background of the cord. This engorgement of the veins has, in a number of exploratory operations, led me to expose more of the cord at a higher level, and I have been enabled to find and remove tumors which would otherwise have been missed. In inflammatory diseases, the nerve roots are also congested, and often bluish-red; but below the level of a compression, the nerve roots are normal in appearance.

Fig. 2.—The amount of bone to be removed in a decompressive laminectomy.

If the roots of the cauda equina are exposed soon (within twenty-four hours) after a lumbar puncture has been performed on the patient, it is not unusual to observe that a few of the nerves are reddish-blue. The changed roots usually lie near the median line, and the discoloration is probably due to slight injury from the lumbar puncture needle. A marked congestion of all the roots of the cauda equina is an evidence of a low grade inflammatory process in the roots. This

occurs in syphilitic disease of the membranes, and in a disease described by Foster Kennedy and myself and by Oppenheim, which we have described as "neuritis of the cauda equina."

THE INJURY TO THE CORD BY THE PRESSURE OF AN EXTRAMEDULLARY TUMOR; TECHNICAL DETAILS IN THE REMOVAL OF SPINAL CORD TUMORS

The amount of compression of the cord by an extramedullary new growth depends on its duration and size. Large intraspinal tumors are usually much softer than small ones. The larger, softer growths cause a more diffuse pressure on the cord, while in the small hard ones the pressure is more concentrated. This is the explanation for the surprising fact that small tumors (on account of their consistency) are more apt to cause a complete and irremediable transverse lesion of the cord.

The amount of injury done to the spinal cord varies also with the location of the tumor. Tumors under a nerve root or under a slip of the dentate ligament are more apt to cause serious injury than growths on the posterior columns.

If, at an operation, a new growth is found which lies under a nerve root or a slip of the dentate ligament, the root or ligamentous band should be divided before the tumor is removed. It is generally inadvisable to make the attempt to free the growth and to pull it out from underneath these structures, for in the necessary manipulations, injury to the cord is apt to occur.

Properly to expose a spinal cord tumor, the arches of at least three vertebrae must be removed. If this does not completely expose the tumor, additional spines and laminae should be taken away, and the incision in the dura extended. The new growth may be adherent to the pia or may have originated beneath the pia, and serious trauma to the cord might follow if the growth was forcibly drawn out of its bed.

If the tumor is found to be very adherent to the cord, as occurs especially in subpial growths, it is often advisable to leave a small piece of capsule behind rather than to make the attempt to free the tumor from the cord. Most spinal growths are well encapsulated, grow very slowly, are clinically benign, and have very little tendency to recur. The danger of relapse if a small piece of capsule is left behind is small, and is more than counterbalanced by the lessened danger of injury to the cord. Several patients, in my experience, in whom a small part of the tumor capsule was left behind at the operation, have remained well for many years.

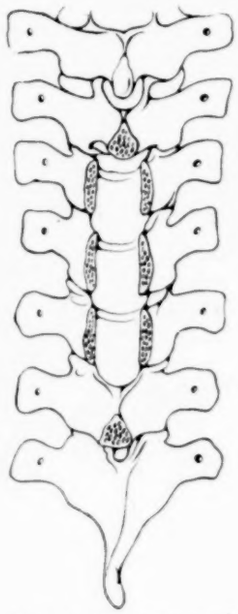


Fig. 3.—The amount of bone removed in a laminectomy, and the removal of the tips of two spinous processes.

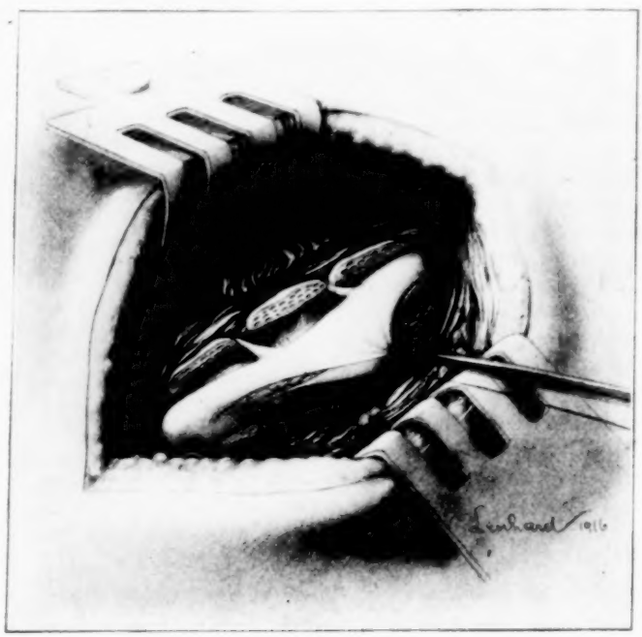


Fig. 4.—Method for the exposure of the posterior surface of the bodies of the vertebrae.

Extramedullary growths on the anterior surface of the cord are rare; I have seen only one among twenty-eight cases. To remove a growth in that location without too much manipulation of the cord requires much dexterity and judgment (Fig. 4). If the growth is a small one, the division of a slip of the dentate ligament on one side may be all that is required for the rotation of the cord and the exposure of the growth. If the tumor is larger, however, the laminae on one side should be rongeured away until the approach to the anterior surface of the cord can be made without much dislocation of the cord itself.

THE MORTALITY OF LAMINECTOMY

The accompanying table gives my operative results in 150 spinal operations for disease and injury. The total operative mortality was fifteen, or 10 per cent. If the cases with a fatal outcome are examined, it will be found that in most of them the patients suffered from an irremediable and rapidly advancing disease. Thus, two patients died after an operation for recent fracture of the cervical spine, with complete crushing of the cord; six patients died after periods of from one day to two weeks following an exploratory operation for acute softening; two patients died after an exploratory operation for hopeless sarcomatous disease of the vertebrae; one patient succumbed after an attempt to relieve a streptococcus sepsis due to acute osteomyelitis of the vertebrae. These eleven patients were all beyond the hope of surgical relief, and the operation must be considered only as a contributing cause of the fatality.

The four other deaths occurred in patients in whom life might have been prolonged if no surgical interference had been undertaken. One patient succumbed from respiratory paralysis a few hours after the removal of a high cervical intramedullary growth. She had had respiratory and cardiac disturbances before the operation, and a quadriplegia. The second patient died two days after an exploratory operation for a high cervical intramedullary tumor, which was infiltrating and was continuous with another growth in the posterior cranial fossa. The third patient had a metas-

tatic growth of the ribs after the removal of carcinoma of the colon, and died three days after laminectomy and posterior root section done to relieve a distressing root pain. The fourth patient, finally, died from an acute ascending paralysis after the division of the anterolateral tracts for pain.

In order to obtain a fair idea of the dangers of a laminectomy in remediable diseases the eleven fatal cases in Group 1 can be fairly excluded as cases of hopeless and surely fatal disease. And a scrutiny of the four cases in Group 2 will show that several of the patients suffered from hopeless disease which would of itself have terminated their lives in a short time. If the cases of Group 1 were excluded, I should have had

RESULTS IN ONE HUNDRED AND FIFTY LAMINECTOMIES*

Laminectomy for:	Number of Cases	Recovered from Operation	Cured or Almost Cured	Markedly Improved†	Little or no Improvement	Died	Died Within One Year	Total
Spina bifida occulta	2	2	..	2	..	..	..	2
Abnormal spinal vessels	5	5	2	3	..	..	..	5
Recent fracture of spine	3	1	..	1	..	2	..	3
Old fracture of spine	7	7	3	4	..	..	..	7
Tumor, extradural removed	3	3	2	1	..	..	..	3
Tumor, extramedullary, removed	16	16	12	4	..	..	..	16
Tumor, intramedullary, removed	9	8	2	4	2	1	..	9
Tumor, intramedullary, not removed	8	7	..	2	5	1	3	8
Tumor of conus and cauda	5	5	..	3	2	..	2	5
Tumor, multiple sarcoma	1	1	..	..	1	..	1	1
Tumor, sarcoma of vertebrae	6	4	..	2	2	2	2	6
Tumor, metastatic	2	2	..	..	2	..	2	2
Aneurysm of spinal vessels	1	1	..	..	1	..	..	1
Exploration	15	15	..	5	7	..	3	15
Exploration, acute softening	6	...	..	..	..	6	..	6
Syringomyelia, hematomyelia	4	4	..	2	2	..	..	4
Neuritis of cauda equina	6	6	3	3	..	..	..	6
Pachymeningitis	4	4	1	3	..	..	..	4
Acute osteomyelitis	2	1	1	..	..	1	..	2
Osteoarthritis	1	1	1	..	..	..	..	1
Spinal decompression	17	17	3	9	5	..	..	17
Spinal decompression, myelitis	3	3	..	2	1	..	..	3
Division of posterior roots	22	21	..	15	5	1	3	22
Division of anterolateral tracts	2	1	..	1	..	1	1	2
Totals	150	135	30	66	35	15	17	150

* There were, in addition, ten secondary laminectomies.
† Many of these patients have recovered entirely.

139 operations with four deaths, or a mortality of 2.9 per cent. I believe that this is about the mortality that the operation of laminectomy should have in individuals who have not a spinal disease which will be rapidly fatal without operative interference.

Madison Avenue and Sixty-Third Street.

ABSTRACT OF DISCUSSION

DR. E. SACHS, St. Louis: The approach to the anterior surface of the spinal cord has always been a difficult problem on account of the important factor that one must not handle central nervous tissue any more than necessary and putting in the retractor to draw the cord to one side is a very dangerous procedure. Dr. Elsberg has pointed out that the different circulatory disturbances apparent as soon as the cord is exposed are of great diagnostic value in determining the character of the pathologic lesion. I am inclined to differ from him in one point, that is, that the congestion of the veins when the dura is opened is an evidence of a lesion higher up. The mere opening of the dura and changing the intraspinal pressure is sufficient to produce congestion of the veins. Dr. Elsberg emphasized also the importance of a dry field. Nothing gives more postoperative trouble after laminectomy than allowing blood to get into the spinal canal. It has been my practice never to open the dura until the field is entirely dry. Then, in order to prevent any blood from getting in from the muscles on either side I make use of Frazier's method, putting in sponges on either side to exclude the muscles as well as the skin from the operative field so that nothing is exposed except the dura and the cord. I have never found it necessary to use a suction apparatus such as Dr. Elsberg illustrates. No doubt it might be of very great value. After the incision has reached the spinous processes he makes an incision through the muscles. That is the cause of considerable hemorrhage. I try never to cut the muscles and stick closely to the bone and peel back the periosteum, starting at the tips of the spinous processes. In that way you can get a very much drier field. His point about taking off a large amount of bone and a great many spinous processes, if necessary, I endorse heartily. As he said, the spinous processes in no way support the spinal column and five or six or seven spinous processes can be removed with impunity and the mobility of the back be as good as prior to that time. The method of hemilaminectomy, which Dr. Taylor of New York has used so extensively, has not been of any advantage in my hands. His emphasis of cutting the posterior roots in order to get more exposure for a tumor rather than trying to get a tumor out through a narrow opening is a method that should be used whenever necessary. Any method that will avoid trauma to the nervous tissue is to be recommended even though you may produce a small zone of anesthesia after cutting a posterior root.

DR. CHARLES ALBERT ELSBERG, New York: After the tips of the spines have been exposed, I formerly used the periosteal elevators to separate the periosteum from the spinous processes, but found that one did much more injury to the muscles than if they were separated by cutting close to the spines. With reference to congestion of the veins when the spinal cord is exposed: It is very true that within fifteen or twenty minutes, if the cord is exposed for that length of time, there is a reflex enlargement of the spinal veins; but the appearance in the conditions I demonstrated is entirely different. The moment one sees these large veins they mean obstruction to the return venous flow and compression of the cord above the level exposed. I am quite sure this enlargement is not reflex; it is a real pathologic condition which has significance and which has in a number of instances led us to look for and remove tumors which otherwise would not have been found.

Fly Extermination.—Hodge (1910) has approached the problem of fly extermination from another viewpoint. He believes that it is practical to trap flies out of doors during the preoviposition period, when they are sexually immature, and to destroy such numbers of them that the comparatively few which survive will not be able to lay eggs in sufficient numbers to make the next generation a nuisance. To the end of capturing them in enormous numbers he has devised traps to be fitted over garbage cans, into stable windows, and connected with the kitchen window screens. Under some conditions this method of attack has proved very satisfactory.

One of the most important measures for preventing the spread of disease by flies is the abolition of the common box privy. In villages and rural districts this is today almost the only type to be found. It is the chief factor in the spread of typhoid and other intestinal diseases, as well as intestinal parasites. Open and exposed to myriads of flies which not only breed there but which feed on the excrement, they furnish ideal conditions for spreading contamination. Even where efforts are made to cover the contents with dust, or ashes, or lime, flies may continue to breed unchecked. Stiles and Gardner have shown that house-flies buried in a screened standpipe forty-eight inches under sterile sand came to the surface.—Riley and Johannsen.

SOME BODILY CHANGES DURING ANESTHESIA

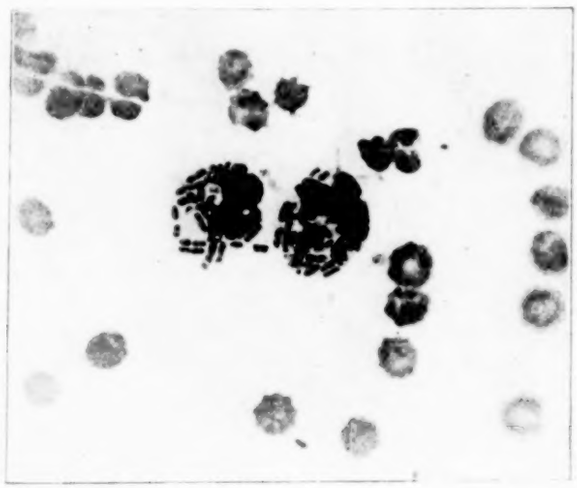
AN EXPERIMENTAL STUDY *

FRANK C. MANN, M.D.
ROCHESTER, MINN.

In studying the bodily changes due to an anesthetic or occurring during the anesthetized state, it is necessary to differentiate carefully the effect of associated conditions. The preliminary excitement, struggling, asphyxia and other accompaning phenomena produce changes quite apart from the anesthetic itself. The compensating physiologic mechanism necessary in light anesthesia is probably not the same as when a deep anesthetized state is produced. A short or long period of anesthesia may differ only in degree, provided the anesthetic tension remains the same.

The present investigation deals mainly with a study of the blood of dogs under ether anesthesia. While the associated conditions, as asphyxia, etc., were also included in the study, in general only the results obtained while the animal was under surgical anesthesia will be emphasized.

The blood is the carrier of the anesthetic substance in every method of general anesthesia, and it is important to know definitely how it is affected by each anesthetic either directly or indirectly. This knowledge is of especial value in view of the fact that today more patients than ever before are being operated on under general anesthesia who have a lower hemoglobin content and more pathologic changes of other kinds.



Photomicrograph of two phagocytes containing bacteria (Experiment 89). These cells had been subjected to five and one-half hours' etherization.

While in the experiments herein reported the methods of etherizing differed, depending on the condition desired, the general procedure consisted in a preliminary etherization in a closed cabinet until the animal was completely relaxed, followed by the employment of the auto-inhalation method.[1] The latter consists in intubating in the same manner as for intratracheal insufflation. The intubation tube is connected through a valve tube with a double perforated ether can, which allows of a limited amount of rebreathing. With little effort, constant anesthesia can be maintained in this manner for long periods.

It was important to determine first whether the amount of circulating blood was diminished. This was estimated according to a method described in a previous publication,[2] which consisted in bleeding the animal from the femoral artery and from the right heart and then comparing the amount of blood obtained with the total amount present in the body, estimated on the basis of 7.7 per cent. of the body weight. While this method gives only comparative results, it is accurate enough, when carefully controlled, to show gross changes. In a series of six normal animals which were bled immediately after being etherized, I was able to obtain an average of 76 per cent. of the estimated amount of blood. In a series of six animals which were bled after from six to nine hours of light etherization, only 64 per cent. of the estimated amount of blood was obtained. The decrease in the amount of circulatory fluid would probably have been much greater if deep anesthesia had been employed. The result is due undoubtedly to loss of muscle tone and venous stagnation, as explained by Gatch.[3]

The lipoids of the tissues seem to have the greatest affinity for the most common anesthetic substance. Of these lipoids, lecithin and cholesterin are the most important. The dissolving power of ether and chloroform for these two lipoids has formed the basis for the best known theory of anesthesia. As it has been shown that lecithin is greatly increased in the blood during anesthesia,[4] it was desirable to know whether the cholesterin content of the blood also underwent changes. Accordingly, determinations of the cholesterin value of the blood were made in one series of experiments. The method employed was that described by Bloor.[5] The cholesterin was estimated just before anesthesia, immediately after a stage of prolonged excitement, and then at different intervals after etherization. In active dogs the cholesterin content of the blood does not seem to undergo any great changes during a period of time equal to that for which our dogs were kept under anesthesia. In the anesthetized dogs it was found to change considerably, but the variations were not uniform enough to permit definite conclusions. In general, it seems that the cholesterin value increases during excitement, decreases below normal after an hour or so of anesthesia, and then gradually increases above normal on further etherization (Experiment 62).

Previous investigation has shown that the viscosity and specific gravity of the blood remain the same under light anesthesia, but both increase when the animal is deeply anesthetized.[6] In several of these experiments the specific gravity was estimated by both the Hammerschlag and the Roy Jones methods, and the foregoing results were corroborated. Under light ether anesthesia the specific gravity of the blood does not change even though the etherization is maintained for as long a period as ten hours. However, when the animal is deeply etherized and respiration becomes

* From the Mayo Clinic.

* Read before the American Association of Anesthetists, Detroit, June 12, 1916.

1. McGrath, B. F.: Anesthesia in Surgical Research, Surg., Gynec. and Obst., 1914, xviii, 765.
2. Mann, F. C.: Shock and Hemorrhage, an Experimental Study, Surg., Gynec. and Obst., 1915, xxi, 430.
3. Gatch, W. D.: The Effect of Laparotomy Upon the Circulation, Tr. Am. Gynec. Soc., 1914, xxxix, 180; Am. Jour. Obst., 1914, lxx, 55.
4. Reicher, quoted by Hewitt, F. W.: Anesthetics, London, The Macmillan Company, 1912, p. 82.
5. Bloor, W. R.: Studies on Blood Fat. II. Fat Absorption and the Blood Lipoids, Jour. Biol. Chem., 1915, xxiii, 317.
6. Burton-Opitz, R.: The Changes in the Viscosity of the Blood During Narcosis, Jour. Physiol., 1905, xxxii, 385.

shallow, the specific gravity increases a few points in the fourth decimal, probably because of the asphyxia.

As ether and chloroform lake the blood, it has been thought that these anesthetics might have a deleterious effect on the red cells and hemoglobin. This possibility was tested in several experiments. A blood count and hemoglobin estimation were made before anesthesia and at different intervals after etherization. The ordinary hemocytometer and a Dare hemoglobinometer were used. As a rule, neither the hemoglobin nor the number of red cells underwent changes greater than the coefficient of error, even after ten hours' etherization. In some of the experiments there was an increase in both, but it was slight. In a few experiments the resistance of the red cells before and after etherization was determined by the fragility test of Ribierre.[7] No change in the resistance of the erythrocytes to hyposmotic salt solution was noted.

Leukocytosis occurs in a dog under ether anesthesia, provided the anesthetic is maintained long enough. Occasionally the white cells increase in number within the first hour of anesthesia, but frequently not until after four hours. The increase may be very slight, in some animals not above the coefficient of error, but usually by the end of the fourth hour of anesthesia the number of white cells has doubled. The leukocytosis is not always progressive. Frequently a maximum number is reached which more prolonged etherization does not change. Sometimes there has been a decrease before the end of anesthesia. Usually, however, the number of white cells does not begin to decrease for a few hours after the animal has recovered from the anesthetic, and is still above normal twenty-four hours after etherization (Table 1).

The leukocytosis just described is practically a constant and general phenomenon. It is not limited to the peripheral circulation, for the white counts are usually the same in the blood from ear veins, femoral veins and mesenteric veins (Experiments 54 and 80). This fact, that the white cells are increased in the blood in widely separated parts of the body, also eliminated the possibility that stagnation to dependent parts or reaction to external irritation were factors. Such leukocytosis occurs in animals in which a moderate leukocytosis is present already (Experiment 91). It resembles a leukocytosis of digestion. All of our experiments, however, were performed on dogs that had not had food from twelve to twenty-four hours. It differs from the leukocytosis produced by drugs, such as pilocarpin, in the fact that it is not a lymphocytosis and atropin does not prevent its occurrence (Experiment 77).

The spleen is not an important factor in its production, for it occurs also in animals that have been splenectomized. Its cause and site of action have not been definitely determined, but it would appear that it is a direct stimulation of the bone marrow.

Differential counts of the blood before and after ether show that there may be an actual increase in all of the forms of white cells, but that the polymorphonuclear cells are usually the only form showing also a relative increase. In only one experiment was a relative decrease of polymorphonuclear cells noted. The large lymphocytes usually decrease relatively, while the small lymphocytes always decrease. The transitional cells usually show an increase. In one experiment the eosinophils increased greatly. The size and character of all the cells remain normal (Table 2).

Studies on phagocytosis have demonstrated that the phagocyte reacts to anesthetics in a manner similar to other unicellular organisms. Fat-dissolving substances, such as ether and chloroform, in weak solutions, stimulate phagocytic activity until a certain optimum strength of solution is reached. Any increase in the amount of anesthetic substance above this produces a decrease in phagocytosis and finally a paralysis of the cells.[8]

In previous studies, the white cells have usually been subjected to artificial environment. They were separated from the blood, suspended in salt solution and, after the addition of the substance with which they were to be tested, such as carbon particles, were incubated for definite periods of time.

TABLE 1.—CHANGES IN THE NUMBER OF WHITE BLOOD CELLS UNDER ETHER AT DIFFERENT HOURS AFTER ANESTHESIA

No. of Exp.	Normal Count	First Half Hour	First Hour	Second Hour	Third Hour	Fourth Hour	Fifth Hour	Sixth Hour	Seventh Hour	Eighth Hour	Ninth Hour
51	.....	18,400	.....	.....	19,100	.....	.....	27,200	.....	.....	39,300
52	.....	10,920	.....	.....	14,470	.....	.....	14,520	.....	.....	15,400
53	.....	15,960	.....	.....	13,420	.....	.....	18,340	.....	.....	18,870
54	.....	13,200	.....	.....	14,400	.....	.....	29,900	.....	.....	29,900
60	7,000	.....	8,100	.....	.....	.....	15,000	15,800			
61	10,400	18,400	.....	20,250	.....	.....	39,900				
69	12,150	13,700	.....	.....	.....	.....	24,000	.....	.....	19,000	
70	21,450	25,000	.....	.....	.....	.....	.....	32,750			
71	20,600	.....	.....	.....	.....	23,450					
72	33,850	44,550	.....	.....	.....	.....	.....	.....	50,450		
73	19,800	.....	.....	.....	.....	.....	39,400	.....	46,100		
74	13,300	13,950	.....	.....	.....	36,400	.....	.....	51,300		
75a	20,000	24,800	.....	30,750	35,000	.....	.....	28,330			
b	8,000	.....	10,000	14,000	17,000	23,850	25,250	25,000	27,000	29,000	
76	14,900	18,700	20,000	26,500	27,300	67,920	29,300	30,000			
77	18,050	.....	18,450	20,000	24,800	28,650	30,500	.....	35,800		
78	21,450	.....	33,650	35,400	44,100	45,000	45,000	.....	.....	40,000	
79	14,000	.....	17,750	21,650	23,850	25,000	21,180	23,050			
80	12,000	18,000	19,250	18,000	21,650	23,300	. ....	24,580			
81	26,000	.....	.....	.....	35,000	.....	.....	39,000			
82	25,000	.....	.....	.....	30,000						
83	18,500	.....	.....	.....	20,100	.....	.....	.....	.....	27,100	
84	12,000	.....	.....	.....	.....	.....	19,452				
85	17,000	.....	.....	.....	.....	.....	19,000				
86	16,100	.....	.....	.....	.....	.....	25,400				
87	15,100	.....	.....	.....	30,500	.....	.... .	47,450			
88	11,800	.....	.....	.....	.....	.....	19,000				
89	21,000	.....	.....	.....	.....	.....	.....	40,100			

7. Ribierre, P.: L'hémolyse et la mesure de la résistance globulaire; application à l'étude de la résistance globulaire dans l'ictère, Thèse de Paris, 1903, quoted by Sahli, H.: Diagnostic Methods, Philadelphia, W. B. Saunders, 1911, p. 769.

8. Hamburger, H. J.: Researches on Phagocytosis, Brit. Med. Jour., 1916, i, 37.

It was deemed of value to determine whether phagocytic activity was altered when the cells were subjected to concentration of the ether such as occurs in the blood under surgical anesthesia. In order to make conditions as nearly normal as possible, the following method was employed: Under local anesthesia one of the jugular veins was exposed, dissected entirely free from surrounding fascia and doubly ligated, a section about 10 cm. long being left between ligatures partially distended with blood. A suspension of *Bacillus coli* in salt solution was injected into this natural incubation tube, and after it was thoroughly mixed by rolling gently between the fingers, the skin was closed over the vessel. Under these conditions the blood does not coagulate, the phagocyte remains in its normal medium at approximately its normal temperature, and has access to the bacteria in approximately the natural way. After various intervals of time, an hour being found the most suitable, smears were made from the enclosed blood. Care was taken that the blood was thoroughly mixed before the smears were made. These slides were used as controls. After definite intervals of etherization, the process was repeated on the other jugular vein with exactly the same technic. The cells in the latter vein had been subjected for several hours to a concentration of ether strong enough to maintain the animal under surgical anesthesia.

TABLE 2.—CHANGES OCCURRING IN THE DIFFERENTIAL BLOOD COUNT BEFORE AND AFTER LONG PERIODS OF ANESTHESIA

Cells	Experiment 75		Experiment 76		Experiment 77		Experiment 79		Experiment 81		Experiment	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Polymorphonuclears	64	86	76	81	78	89	66	86	79	90	76	
Large lymphocytes	13	5	9	6	6	3	6	6	6	5	10	
Small lymphocytes	17	2	10	7	7	2	20	2	7	0	5	
Transitionals	3	6	5	6	6	5	1	3	2	3	4	
Eosinophils	3	1	0	0	3	1	7	3	6	2	5	

The blood smears were stained, and a count of the phagocytes containing bacteria and the phagocytes without bacteria was made. Usually 200 white cells were counted on a slide, and frequently counts were made on several slides from one vein. The average was taken as the final result. Only the polymorphonuclear cells were included in this count. The occasional large lymphocyte or eosinophil containing bacteria was ignored. It is obvious that there are chances for error in the method, but I do not believe the average error exceeds 10 per cent.

TABLE 3.—PHAGOCYTOSIS BEFORE AND AFTER ETHERIZATION

Exp. No.	Normal Count W. B. C.	Count of W. B. C. at Time Bacteria Were Injected After Etherization	Percentage of Cells of Normal Blood Containing Bacteria	Percentage of Cells of Etherized Blood Containing Bacteria	Number of Hours Etherized
87	17,000	19,000	73.5	87	5
88	16,100	25,400	21	30.5	5
89	15,100	47,450	45.5	57.5	5½
90	11,800	19,000	50	50	5
91	21,000	40,100	90	90	6

The results show that phagocytes which have been subjected for from four to six hours to a concentration of ether which is capable of maintaining a dog under surgical anesthesia do not exhibit any marked changes in activity. In most of these experiments the greater number of cells containing bacteria was found in the blood subjected to the ether, but the increase was not sufficient to be of positive significance. It can be definitely stated, however, that there was no decrease in the phagocytic power of the cells in the blood subjected to etherization (Table 3 and illustration).

TABLE 4.—FINDINGS IN EXPERIMENT 54

	Red Blood Cells	White Blood Cells	Specific Gravity	Hemoglobin	Blood Pressure
Blood taken from peripheral veins:					
Immediately after etherization	5,775,000	13,000	41	70	105
Three hours after etherization	5,437,000	14,400	41	..	80
Six hours after etherization	5,675,000	29,900	41	..	75
Nine hours after etherization	6,020,000	29,900	42	71	60
Blood taken from portal circulation:					
Nine hours after etherization	6,050,000	25,700	42	72	..

SUMMARY

A study of the blood of dogs subjected to etherization demonstrated the following facts: The amount of circulatory blood is diminished about 10 per cent. after from six to nine hours of light etherization. There are variations in the cholesterin values, but the changes are not uniform. The specific gravity does not change under light etherization, and under deep anesthesia increases only as asphyxia becomes a factor. The number of red corpuscles, the amount of hemoglobin, and the fragility of the red cells do not change. There is always a leukocytosis in ether anesthesia. The degree of leukocytosis varies from a very slight increase in the number of cells to more than double the normal number. The increase is usually present after from three to four hours of etherization, and is due mainly to cells of the polymorphonuclear form. The leukocytosis is not dependent on the spleen and is not prevented by atropin. It is probably the result of a direct action on the bone marrow. Phagocytic action is certainly not depressed by an etherization period of from five to six hours.

The following experiments are presented as typical of the series they represent:

EXPERIMENT 54.—July 27, 1915, a young adult female terrier, weighing 5 kg., at 7:55 a. m. was etherized and blood data were taken immediately. The apparatus was arranged to record the carotid blood pressure.

EXPERIMENT 62.—Feb. 19, 1916, female bull terrier in excellent health; weight 17.6 kg.

8:20 a. m.: Blood withdrawn from left jugular vein for cholesterin estimation. Animal very quiet. Cholesterin value, 0.266.

8.21 a. m.: Animal placed in etherizing cabinet and etherized very slowly.

8:50 a. m.: Animal intubated.

8:52 a. m.: Blood withdrawn; cholesterin value 0.312. Animal kept under surgical anesthesia.

9:55 a. m.: Blood withdrawn. Cholesterin value, 0.180.

Animal maintained under anesthesia until 3 p. m. when, after another test was taken, it was allowed to recover.

3 p. m.: Blood withdrawn, cholesterin value, 0.358.

EXPERIMENT 77.—April 1, 1916, male mongrel; animal very quiet; weight 15.1 kg.

8 a. m.: Animal was given ⅙ grain morphin and 1/100 grain atropin subcutaneously.

8:30 a. m.: Count of white blood cells was taken.

8:45 a. m.: Etherized quickly by Cone method. Animal maintained under surgical anesthesia until 4 p. m., when it was allowed to recover.

The counts of white blood cells were as follows:

8:30 a. m.,	18,050
10:00 a. m.,	18,450
11:00 a. m.,	20,000
12:00 m.	24,800
1:00 p. m.,	28,650
2:00 p. m.,	30,500
4:00 p. m.,	35,800

EXPERIMENT 89.—May 3, 1916, adult mongrel, male; weight 9 kg.

8:15 a. m.: Count of white blood cells taken from right ear vein and smears for differential count. Right jugular vein exposed under local anesthesia. Doubly ligated vein leaving it almost filled with blood. Length of vein, 8 cm. Total white cells, 15,100. Differential count: polymorphonuclears, 70; large lymphocytes, 10; small lymphocytes, 5; transitionals, 4; eosinophils, 5.

8:30 a. m.: Injected 1 c.c. suspension of *Bacillus coli* into vein. Vein markedly distended. Gently mixed by compression.

9 a. m.: Animal etherized.

9:30 a. m.: Smears taken from right jugular vein showed that 45.5 per cent. of the phagocytes contained bacteria and 54.5 per cent. did not contain bacteria.

11:30 a. m.: Took count of white blood cells from right ear vein; count 30,500.

2:25 p. m.: Took count of white blood cells and smears for differential count from abdominal vein. Total count of white cells from abdominal vein, 47,430. Differential count: polymorphonuclears, 93; large lymphocytes, 3; small lymphocytes, 1; transitionals, 2; eosinophils, 1.

2:30 p. m.: Exposed and ligated left jugular vein. Injected 1 c.c. of same suspension of *Bacillus coli*. Technic same as used on right vein.

3 p. m.: Count of white blood cells from mesenteric vein, 46,650.

3:30 p. m.: Smears made from blood of left jugular vein showed that 57.5 per cent. of the phagocytes contained bacteria and 42.5 per cent. did not.

EXPERIMENT 91.—May 11, 1916, young male, mongrel; had had distemper for about four days; weight 8.5 kg.

8:20 a. m.: Exposed left jugular vein.

8:44 a. m.: White blood cells, 21,000.

8:45 a. m.: Injected suspension *Bacillus coli* into ligated vein.

9 a. m.: Animal under ether.

9:45 a. m.: Made smears from left vein. Of the phagocytes 90 per cent. contained bacteria.

Animal maintained under surgical anesthesia.

3 p. m.: Exposed right jugular vein and injected bacteria.

3:02 p. m.: Count of white blood cells, 40,100.

4 p. m.: Made smears from right vein. Ninety per cent. of the phagocytes contained bacteria.

Speech Following Explosions.—After explosions it has been found that in some of the survivors speech is affected. In some instances speech is entirely lost, and only comes back after many days. In others there is great difficulty in forming the words, and as the patient's mind generally is slow and confused, there is a curious impression given to the observer of great effort in the attempts to speak. The patient often repeats himself, iterating and reiterating words or phrases. This affection of speech may and generally does last only for a few days, but in rarer cases it may be months before speech returns to normal.—Glaister.

NITROUS OXID-OXYGEN ANESTHESIA IN MAJOR SURGERY *

A. B. COOKE, A.M., M.D.
LOS ANGELES

To avoid misunderstanding, let me state at the outset that this paper is written from the point of view of the operator, not the anesthetist. No claim is made to special knowledge concerning the theory and technic of general anesthesia or the abstract merits of the several anesthetic agents, and no academic discussion along these lines will be attempted. My sole purpose is to present conclusions based on personal experience in operating under nitrous oxid-oxygen anesthesia, and to indicate some of the practical advantages it has seemed to afford in the field of major surgery.

It is fair to say at this point that no opinion as to the comparative value of anesthetics and methods of anesthesia is entitled to weight unless it is founded on the actual clinical experience of a competent and strictly impartial observer. Mere impressions are apt to be misleading; conjecture with reference to any scientific problem is always worse than useless. Desire to know the truth is the first essential. This established, the conditions of the investigation are quite certain to be safeguarded, and the final verdict to be a just one.

During the past three years I have performed approximately 300 major operations under nitrous oxid-oxygen anesthesia. Without stopping to enumerate them in detail, I may say that the list includes thyroidectomy, prostatectomy, the several procedures requiring preliminary dilatation of the sphincter ani, and excision of the rectum, as well as the various operations on the abdominal and pelvic viscera. In the great majority of these cases (certainly not less than 90 per cent.) not a drop of any other general anesthetic was used, though in practically all cases I employed local anesthesia in addition. I approve and advocate the addition of ether when it is indicated, in amount sufficient to secure the result desired; but from clinical observation I am of the opinion that, where this is necessary, it is because of some fault in the preparation of the patient, or, more rarely, due to some extraordinary complication of the operation itself. In such cases the amount of ether required is usually very small, not exceeding 1 or 2 drams as a rule, and a second occasion for its use rarely arises in the same operation.

In this connection it should be emphasized that local anesthesia is a most valuable adjunct to the successful employment of gas anesthesia. This is particularly true in abdominal cases in which muscular relaxation must be had to avoid undue traumatism. Here the result desired is readily accomplished by carefully infiltrating the nerve-bearing tissue of the abdominal wall with a weak solution of novocain (1:400) or cocain (1:1,000). The degree of relaxation secured is a true index to the thoroughness of the local infiltration.

The operative time in the 300 cases referred to varied from thirty minutes to two hours, averaging probably about one hour. I have not found it necessary in any case to suspend the work because the anesthetic was not well borne. In fact, as my confidence

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

in the gas-oxygen method and in my anesthetist has increased, I have come to look with less and less anxiety on cases that heretofore seemed most formidable, and to find myself willing to offer the aid of surgery to patients whom I should formerly have advised against operation.

In the entire series there was no fatality in any way chargeable to the anesthetic. Further, there was not an instance in which danger from this source even threatened a patient. Dr. R. F. Hastreiter, who has administered the gas most often for me, tells me that he has now administered it for surgical anesthesia more than 500 times without a fatality and without unfavorable symptoms in a single case.

DISADVANTAGES

There are certain inherent difficulties and disadvantages in the use of nitrous oxid. The first and most important of these is the difficulty of finding anesthetists skilled in its administration. The prevalent idea that anybody, including student and nurse, can give the anesthetic emphatically does not apply to this agent. On the contrary, rare judgment and much experience are required for its safe and successful employment. Happily this difficulty is not insuperable, since competent men are taking up the work in every community as the demand for gas anesthesia increases.

Another disadvantage is the more or less cumbersome character of the apparatus required. The ingenuity of the manufacturers has done much to overcome this difficulty, simplified outfits, both hospital and portable, being now provided which, if given proper care, are quite satisfactory. Where one is so fortunate as to be able to concentrate all his work in a single perfectly equipped hospital, this disadvantage is readily eliminated.

A third disadvantage is the relatively high cost of the gas. This has been greatly reduced by the improved methods of manufacture and handling, and to an equal or greater extent by improved methods of administration. Strictly speaking, the matter of cost does not enter into the question. The real consideration concerns only the best interests of the patient.

One other difficulty should be mentioned, namely, that of securing nitrous oxid entirely free from inpurities. When nitrous oxid first came into use as a general anesthetic, it was thought that a certain amount of cyanosis was necessary and inevitable in every case. We now understand that this condition is to be regarded as a danger signal, due for the most part to poisonous impurities in the gas, though it is, of course, true that the same effect may be produced by the unskilled anesthetist with gas of the purest quality. The valuable paper of Warner,[1] describing the experience of Lakeside Hospital, clearly establishes the facts that it is perfectly practicable to produce pure gas, and that with the impurities the dangers of this agent as an anesthetic virtually disappear. His observation that entire freedom from cyanosis may be maintained, while the patient is otherwise presenting symptoms of asphyxia, is deserving of special note.

LIMITATIONS

The applicability of nitrous oxid as an anesthetic embraces the entire field of surgery, so far as my experience goes, wth a single exception. It is not satisfactory in major operations on the mouth, nose and air passages. To maintain surgical anesthesia with this agent requires the complete exclusion of atmospheric air, and the effect is so evanescent that the mask cannot be removed even momentarily without the patient's arousing. Breathing tubes have been devised to overcome this difficulty, but with only partial success. In such cases the anesthesia may be induced by the gas and ether substituted before the operation proper is begun, the patient thus escaping the primary stage of irritation and excitement. With this exception I know of no limitations in the practical application of this method of anesthesia.

ADVANTAGES

The advantages of nitrous oxid are numerous and may well be considered under two heads: first, those which concern the patient, and second, those which concern more particularly the operator and the hospital.

The two most important considerations from the standpoint of the patient are, of course, safety and comfort. Given a pure gas and a competent anesthetist, I am fully convinced that nitrous oxid is at least equally as safe as ether and, when the possibility of postoperative complications attributable to the anesthetic is included, more so. No one will gainsay that no such marked depression is observed following the former as the latter. In explanation of this fact we have only to remember that ether lowers the blood pressure while nitrous oxid raises it; that free perspiration and the consequent dissipation of the body heat is the rule under ether, while such a phenomenon is rarely observed under nitrous oxid; that the effects of ether are persistent, lasting usually for twenty-four hours or longer, while the effects of nitrous oxid are by comparison decidedly transient. We further know that ether is one of the best of all lipoid solvents and that, being so diffusible, it permeates practically every fat-bearing tissue of the body, necessitating increased elimination at a time when the patient's organs are least able to respond. Postoperative pneumonia and suppression of urine following ether anesthesia are by no means rare. It will probably never be definitely known just how often the lighting up of a latent tuberculous process or the inception of an ultimately fatal nephritis may be due to the same cause.

Many factors contribute to the comfort of the patient under nitrous oxid-oxygen anesthesia. Any fair-minded observer who will study and contrast the condition of the patient before, during and after the operation in two similar cases, or series of cases, in which gas and ether respectively are administered by equally competent anesthetists, cannot fail to be impressed with the comparative merits of the former in this regard. The disagreeable effects of ether anesthesia are common knowledge, and inspire no small part of the dread with which surgery is contemplated. With the proper assurance in advance, the patient approaches nitrous oxid anesthesia in a much more tranquil frame of mind — unquestionably a distinct gain. Nitrous oxid is nonodorous, nonirritating, and produces unconsciousness with the first few inhalations. No sensation of strangling, no talking or struggling, no nausea result. When the flow of gas is stopped, full consciousness is regained in a very few moments, and nausea and vomiting are chiefly notable for their rarity of occurrence. In the exceptional case in which emesis is seen, it is more in the nature of a simple regurgitation, usually occurs only once, and is

1. Warner, A. R.: Manufacture and Administration of Nitrous Oxid for Anesthesia, THE JOURNAL A. M. A., Dec. 4, 1915, p. 1973.

not accompanied by the deathly nausea and depression which result so commonly from ether. With respect to the several bodily functions, the normal is regained with striking rapidity. This is a matter of hours, not days, and convalescence from the operation, not from the operation plus the anesthesia, is much more promptly established, of shorter duration, and more comfortable in every way.

The gentleness of manipulation required, in operating under nitrous oxid, I regard as one of its most pronounced advantages. The anesthesia produced by this agent is never so deep and deathlike as that of ether. To operate successfully under nitrous oxid demands a studied respect for all tissues at every stage. By this means unnecessary traumatism is avoided, the amount of postoperative wound repair lessened, and the vitality of the patient conserved. The surgeon who regards the spectacular and his time record of supreme importance cannot hope to find this method of anesthesia entirely satisfactory.

I am convinced that nitrous oxid very appreciably broadens the field of surgery in that it makes it possible to extend its benefits to certain cases and conditions in which the administration of ether would involve too great danger. It is no small thing to be able to assure a weakened and suffering patient that he may have the chance of relief to which he is entitled without assuming undue risk from the anesthetic itself. Several times within my own experience, patients have been successfully operated on when, with ether as the dependence, I should have approached the cases with the utmost reluctance and apprehension, if, indeed, I could have persuaded myself to undertake them at all.

From the standpoint of the operator and the hospital there are several additional advantages in nitrous oxid anesthesia which, while of secondary importance, to be sure, are yet worthy of being mentioned. There is a considerable saving of time in the operating room because of the rapidity with which the gas acts and because, when the operation is over, the patient, conscious and quiet, may be returned to his bed without the usual delay. The few minutes thus saved in handling a single case might easily swell into an hour or more in the course of a busy day — an item of no little moment both to surgeon and operating-room force.

A further very decided advantage to the hospital develops in the postoperative care of gas patients. The time of every hospital employee has a definite money value. After ether anesthesia the more or less constant attention of a nurse is usually required for a period varying from a few hours to twenty-four hours or more, depending on the amount of depression and the persistence of nausea and vomiting. This costs money. The use of gas does away with the need for so-called recovery rooms, the patient, conscious and comfortable, being returned directly to his own bed in a ward or room. Thus the disturbance of other inmates is minimized and the natural apprehension of other patients approaching the ordeal of operation allayed, instead of increased.

CONCLUSION

There is no topic before the profession today commanding greater interest than that of anesthesia, and rightly so, for it is universally recognized that further progress in surgery is dependent in no small degree on advances along this line.

The ideal anesthetic for major surgery is the one capable of producing analgesia and unconsciousness without danger or discomfort to the patient. Any agent or method which furthers this ideal — which tends in any way to relieve surgery of its harshness, and to smooth down the rough places on a road to health that patients justly regard as both formidable and forbidding, should receive our most earnest and open-minded attention. My experience with nitrous oxid as an anesthetic would seem to warrant the conclusion that it is entitled to high rank in this beneficent class.

508 Hollingsworth Building.

ABSTRACT OF DISCUSSION

DR. W. I. TERRY, San Francisco: I am in full accord with Dr. Cooke's conclusions as to the use of nitrous oxid and oxygen in major surgery. I have used this method consistently for the past four years in about 1,200 major cases and I am convinced that from the standpoint of the patient himself it is the best and safest anesthetic we have, when supplemented by local anesthesia. The absence of odor, the rapidity of action, the minimized after-effects are all for the comfort of the patient. The absence of heart, kidney, liver, blood and lung conditions postoperatively are the factors of safety which do not apply to the same degree with other general anesthetics. It seems to me that there are two principal reasons why the method has not had a very extended use. First, the lack of thoroughly trained anesthetists, and second, the increased cost. Both these factors will prevail against it until they can be modified and ether will still remain the method of choice where nitrous oxid and oxygen are not obtainable under the right conditions. Another objection that has frequently been made is the lack of muscular relaxation, particularly in abdominal work. This, to me, is simply a matter of technic in the use of the local anesthetic. When the local anesthetic is employed properly muscular relaxation is obtained, provided always that the nitrous oxid is given properly and the patient is kept in the right condition. With alcoholics, however, and some athletes, it is often necessary to give a little ether in addition, but in a minimum amount. The total is very small, indeed, in these cases. Another objection is that more time must be taken to do these operations, but time should not be measured against safety.

DR. CHARLES K. TETER, Cleveland: Nitrous oxid oxygen in general surgery has been in practically constant use in at least two Cleveland hospitals for over ten years. Cleveland was, I think, the first city where a nitrous oxid plant for the manufacture of nitrous oxid was installed in a hospital. The plant was installed first in St. Luke's Hospital about nine years ago and a little over one year afterward another plant was established in Lakeside Hospital. These plants, with modifications, have been in use ever since. Constant use of nitrous oxid in major surgery has proved to us that this anesthetic has its limitations, and I do not think that we have been led so far in our enthusiasm as to claim that it is the anesthetic of choice in every case. In most cases of minor surgery nitrous oxid and oxygen will give sufficient depth of anesthesia so as not to interfere with the accomplishment of the operation. The physical properties of nitrous oxid are such that it must be given at least 80 to 95 per cent. pure in order to bring about surgical anesthesia. No oxygen is liberated during its sojourn in the organism. Therefore it is an asphyxiant as well as an anesthetic, so that when you withhold less than the normal amount of oxygen in atmospheric air you have a certain degree of interference with normal oxidation, and if you give as high as 20 per cent. of oxygen you will not have surgical anesthesia, as we understand it. You will have perfect unconsciousness but not relaxation of the musculature. Then it becomes necessary to add something to nitrous oxid. Our method is to use preanesthetic narcotics, as morphin, ⅛ to ¼ grain, atropin, 1/150 to 1/100 grain;

then if relaxation cannot be had, a sufficient amount of ether vapor is added to the mixture. Some object and say, "If you must add ether what is the use of giving nitrous oxid at all?" I claim that if you can withhold even 2 ounces of ether in a major operation you have done a great favor to that patient. In most of the apparatus on the market you will find ether attachments and some of you have probably noticed that there is a considerable amount of ether used during an hour's anesthesia. For instance, there may be 4 ounces of ether taken up in the gas as it passes through it, but you must remember that the 4 ounces of ether does not all go to the patient. There is a considerable volume of the gas escaping through the exhalation valve and a lot of this ether is wasted.

STAB WOUNDS OF THE CHEST INVOLVING THE DIAPHRAGM

WITH DIAPHRAGMATIC HERNIA OR EVISCERATION *

CHARLES C. GREEN, M.D.
HOUSTON, TEXAS

Although man has inhabited this world nearly 8,000 years and has possessed a temper since the time of Cain and Abel, and has had in his possession a knife or some kindred instrument, with which he has inflicted wounds in almost every portion of the human anatomy, yet not until recently have there appeared in literature any reports of stab wounds of the diaphragm, with diaphragmatic hernia, or evisceration.

The question then naturally arises, Is there an increase of this character of injuries, or are we becoming better diagnosticians and now recognize them, where they were previously overlooked?

The latter is the more logical conclusion, as there has been no change in the anatomy of man, and little or none in the character of cutlery used by him in settling his personal difficulties.

The term "hernia," as applied in these cases, is a misnomer, since hernia always has a sac, which in these cases is lacking. Consequently the term "evisceration," which is used entirely by the French writers, is the more correct.

Diaphragmatic hernia and evisceration are found on the right side in 8 per cent., and on the left side in 92 per cent. of all cases. The small percentage of cases found on the right side is due to the fact that the liver is situated on this side, and acts as a plug for almost any opening that may be made in this locality.

Quite recently, a great deal has been written on this subject, and the most comprehensive articles have been contributed by Wolf, Iselin, Suter and Magoula.

Magoula's article was published in 1910, and includes all cases previously reported by Wolf, Iselin and Suter, with some additional cases. Therefore, I invite attention to a brief review of this paper.

Magoula reviewed the whole subject of stab wounds of the chest in 1910, and reported 190 cases of injury to the diaphragm; but by no means did all of these have hernias.

Of the sixty-four cases reported by Suter, forty-four cases showed protrusion at the outer wound; five showed protrusion of the omentum into the pleura; ten showed only slight protrusion through the diaphragm, and five showed the stomach herniated through the diaphragm.

Of the thirteen cases reported by Wolf, five showed hernia.

Of sixty-one personal cases reported by Magoula, nine showed the omentum at the outer wound, and four showed protrusion through the diaphragm.

Of forty other cases collected by Magoula, twelve showed the omentum at the outer wound, and four showed the viscera through the diaphragm.

Hence, of the 190 cases reported by Magoula, ninety-eight, or nearly 52 per cent., showed hernia, or better, evisceration.

From this brief review it is seen that the total number of cases of wounds of the chest, involving the diaphragm, with a hernia, is ninety-eight, plus twenty-five others that have been reported since the publication of Magoula's paper, as follows: Bamberger, Frassi, Caffee, Gautierand Du Seutre, Fato, Gourevitch, Gougorlof, Klaggs and Krymholz, each one; McGuire, Negroni and Wiess, each two; Jobes three, and Davis seven, making a grand total of 123 cases which have been reported.

To this number I wish to add six cases which I treated at St. Joseph's Infirmary, Houston, Texas.

REPORT OF CASES

Case 1.—Man, aged 28, white, married, was admitted to the hospital with a stab wound of the left chest just posterior to the midaxillary line, through which about 6 inches of omentum were protruding, at the ninth interspace. The wound was inflicted by his wife with a carving knife. He was immediately given ½ grain of morphin and 1/150 grain of atropin. He was taken to the operating room, and under anesthesia a median incision was made. A careful examination of the cavity showed that there were two incisions in the omentum, and a small incision in the stomach through all coats except the mucous membrane. The bleeding points were caught and ligated, and the incision in the stomach was closed with a fine catgut suture.

Further examination of the cavity disclosed the fact that there was an opening in the diaphragm, through which some of the viscera had escaped into the thoracic cavity. With one hand in the cavity I succeeded in replacing them, but they were immediately sucked back into the thorax, with a great deal of force and an audible, sucking sound. The abdomen was then closed, as we found it next to impossible to conclude the operation through this opening. We then enlarged the wound of entrance, excised a portion of the rib, and, on inspection, found that all of the transverse colon, and omentum, a portion of the descending colon and jejunum and stomach were in the thoracic cavity. After some difficulty, they were replaced into the abdominal cavity, and the edges of the rent in the diaphragm were caught up with forceps and sutured with No. 3 chromic catgut, and the outer wound was closed without drainage.

The patient was then taken to the ward and made an uneventful recovery. He left the hospital in twelve days, and today is in perfect health.

Case 2.—Man, aged 32, white, married, was brought into the hospital with a stab wound of the left chest in the midaxillary line, at the seventh interspace, with 4 inches of omentum protruding. He was suffering from profound shock, but reacted nicely after the administration of ½ grain of morphin and 1/150 grain of atropin. He was then taken to the operating room and under ether anesthesia, a median incision was made. A portion of omentum and stomach was found in the thoracic cavity with a large rent in it, from which there was profuse hemorrhage. This point was picked up and ligated, and, no other injury being found, the abdomen was closed in the usual way. The wound of entrance was then enlarged, as in the first case, but we did not find it necessary to resect the rib. The stomach and omentum were returned into the abdominal cavity, the opening was closed as in Case 1, and the patient was sent to the

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

ward. This man had a stormy time, as he developed an acute dilatation of the stomach on the second day after the operation; but by free use of the stomach tube he recovered, and left the hospital on the fifteenth day and, when last heard of, was in good health.

CASE 3.—Man, aged 28, colored, married, was brought into the hospital markedly intoxicated, with a stab wound in the left chest about 1 inch posterior to the midaxillary line at the eighth interspace, with 3 or 4 inches of omentum protruding. He was profoundly shocked when admitted. He was given ½ grain of morphin and 1/150 grain of atropin. He was then taken to the operating room and under ether anesthesia, a median incision was made. The transverse colon and omentum were found in the chest cavity; a slit in the omentum, and a considerable amount of blood were found in the abdominal cavity. The bleeding point was caught up and ligated, and the abdomen closed, and the thoracotomy performed as in the previous case. The patient was sent to the ward and did fairly well for about fifteen hours, when he began to be very restless; his temperature began to rise, his kidneys became rather sluggish, and in spite of all we could do for him, he died about forty-eight hours after the operation, from what we diagnosed as acidosis.

CASE 4.—Man, aged 26, colored, single, was brought into the hospital with a stab wound of the left side at the seventh interspace, in the midaxillary line, with about 3 inches of omentum protruding through the external wound. This patient was so profoundly intoxicated that he could not stand up. He complained of very little pain, and that was near the sternum. His abdomen was opened and examined, and a large amount of omentum was found in the thorax; there was found in the transverse colon an opening about 2 inches long. This was closed and a drain left in the abdominal incision, as some feces were found in the cavity. The chest was opened, as in the previous case, and the opening in the diaphragm closed without any difficulty. The patient was sent to the ward and did very well for the first twenty-four hours, when he developed almost the same symptoms as those in the previous case, and died in thirty-six hours after the operation.

CASE 5.—Man, aged 26, white, single, was brought into the hospital with a stab wound of the left side at the tenth interspace about 3 inches posterior to the midaxillary line. He showed a fair amount of shock, and had 6 inches of omentum protruding through the external wound. The abdomen was opened in the usual way, and a portion of the stomach was found in the thorax; there was a wound in the gastrocolic omentum, which was bleeding rather freely. This bleeding point was ligated, and the chest opened in the usual way, after the abdomen had been closed without drainage. The patient was sent to the ward and given the usual treatment, namely, ¼ grain of morphin according to circumstances, water freely, and allowed change of position when desired. After forty-eight hours he was given a saline cathartic and the next day was given a light diet. He made an uneventful recovery and left the hospital on the tenth day; when last seen he was in the best of health.

CASE 6.—Man, aged 30, white, single, entered the hospital with two stab wounds of the left chest, one at the seventh interspace anterior to the midaxillary line, and the other at the ninth interspace 3 inches posterior to the midaxillary line. Being on the lookout for this class of cases, we at once thought of a stab wound of the diaphragm and decided to do an exploratory thoracotomy. We first enlarged the upper wound, but could not detect any injury to the diaphragm at this point; so we closed this opening and enlarged the lower wound, where we found a small opening in the diaphragm, with a portion of the omentum in the thoracic cavity. This opening was closed without drainage, but the abdomen was not explored, as the patient's condition was so good that we could not believe he had received any injury to any of the abdominal viscera. He was sent to the ward and made a very rapid recovery, being able to attend court on the eighth day. He has had no trouble, and now is doing hard work in Houston, apparently in the best of health.

COMMENT

From this report it is evident that the diagnosis was readily made before operation in every case except one, as the omentum was protruding through the external wound in all except the last case.

This is not always the case, however. In many instances, as substantiated by Magoula's report, the diagnosis is not made until months or years later, when the patient begins to show signs of obstruction, as the result of adhesions around the viscera, which have herniated through the opening in the diaphragm. This, in many cases, is not diagnosed except by the use of the Roentgen ray.

As the result of difficulty of diagnosis in most of these cases, we are confronted with questions such as these: First, What is the duty of the surgeon in such cases? Second, How far should he go, and how much time should he spend in attempting to arrive at a diagnosis before he is warranted in doing an exploratory thoracotomy?

The mortality in these cases is very high, both in the complicated and the uncomplicated. For instance, in the uncomplicated cases we find in Magoula's report a mortality of 20 per cent., and in the complicated, 64 per cent.

With such a high mortality, therefore, a surgeon should be very careful not to do anything that would increase the shock, yet he should not sit idly by and allow his patient to go into a profound state of shock before going to the rescue.

Consequently, in cases in which we cannot arrive at a diagnosis quickly, but have reason to believe that there is injury to the diaphragm, and probably to the abdominal viscera, I believe that it is not only the surgeon's privilege, but also his duty to resort to an exploratory thoractomy. By this exploratory operation he will be able, not only to control any bleeding, or repair any damage that may have been done to the viscera, but also to close any opening that may have been made in the diaphragm, which, if not closed, may be the cause of a great deal of trouble, or death of the patient in later years.

In conclusion, let me make a plea for the more general use of exploratory thoracotomy in the treatment of these cases, since, if it is properly done, the dangers of the condition are not increased, and certainly many lives will be saved which otherwise would be lost.

ABSTRACT OF DISCUSSION

DR. JAMES E. MOORE, Minneapolis: What shall we do in cases of stab wound in the chest? Too often the tendency has been to wait for the patient to bleed to death before we see whether we could do anything. We were justified somewhat in our hesitation because until recently whenever we attempted to open the thorax we had staring us in the face the collapse of the lung. Then we got the cabinet of Sauerbruch. Fortunately we do not need that today, for we have the simple method of intratracheal insufflation. Giving the anesthetic in that way we can open the thorax with impunity so I would advise every man when he has a patient come to him with a stab wound of the chest, particularly if he knows that the instrument pointed downward, to make an exploratory operation. It is simple and safe and he will save many lives by so doing.

DR. CHARLES C. GREEN, Houston, Tex.: The main danger in thoracotomy is collapse of the lung. It is the principal cause of shock in these cases. In accident cases, such as I have reported, that condition already exists. By enlarging the opening and getting in there, it is a great deal easier to pick up the diaphragm from above and pull it up to the

opening in the chest than it is to work from below. After my first operation I found that by making a long intercostal incision it was not necessary even to resect a rib, but having assistants, using small powerful retractors it was easy enough to pull the ribs apart, pick up the diaphragm and suture it. Just as long as you can pick up the diaphragm and hold these edges together there is practically no danger of the viscera being forced up against the diaphragm and included in the suture. I do not see why there should be many deaths unless there is a great deal of shock or trauma.

THE FACTOR OF FEAR IN NERVOUS CASES*

HUGH T. PATRICK, M.D.
Clinical Professor of Nervous and Mental Diseases, Northwestern University Medical School
CHICAGO

In many cases of functional nervous disorder, the factor of fear is quite obvious. But in many cases, though equally important, it is not at once apparent. Of the latter, there are numerous varieties which may be divided into many groups. One group embraces patients known to have physical courage:

A few years ago there was referred to me the most noted pugilist of his day, a specimen of perfect physical manhood, known to be not only fearless in the ring but peculiarly carefree if not careless. He was suffering with what were considered rather vague and baffling nervous symptoms, principally insomnia, lack of interest, and moodiness. A careful analysis[1] soon revealed that some trifling symptoms due to high living and domestic friction had served to put the idea into his head that he was losing his mind. This phobia was his sickness, and the fear so possessed his soul that he was good for nothing until he got rid of it. Needless to say, the patient himself was quite unconscious of the nature of his trouble, and his physician had overlooked it.

A sheep rancher of Wyoming was referred to me because of insomnia, loss of appetite, abdominal distress, general nervousness and inability to look after his ranch. What really was the matter with him was fear of cancer of the stomach. This phobia completely unnerved him and caused him enormously to magnify every bodily sensation. But was he a nerveless coward? Decidedly not. There was a time when the cattlemen of the Far West made sheep raising a hazardous occupation. Through those dangerous years he lived without a tremor, though he never went to sleep without a rifle by his side. Once he was informed that three cattlemen had started out "to get him," and the information was correct. He mounted his horse and, properly armed, rode to meet them. As he expressed it, he "talked them out of it,"[2] and the three would-be assassins turned and rode away. In this encounter he was not in the least apprehensive or uncomfortable, and I learned of the incident only in casual conversation about his business.

A policeman, 49 years old, consulted me for intractable insomnia, head pressure, general nervousness and loss of weight. He was not a man to suspect of fear. For many years he had been on active service in one of the worst precincts of Chicago, and on account of his familiarity with criminals was frequently sent after the worst types. He had been in numerous "gun" fights. Once a notorious "gun" man standing beside him fired point blank at his head. All this disturbed his equanimity not a whit. And yet his illness was the result of fear, pure and simple. It came about in this way: a malicious person had preferred against him charges of misconduct, and he was cited to appear before the trial board. This worried him greatly. Innocent, he keenly felt the disgrace of the accusation and feared that he might be suspended or even discharged. He trembled for his well earned good name and for his home, on which there was a mortgage. Naturally, he began to sleep poorly, to have queer feelings in his head, and then to feel uncertain of himself. At this juncture some friends sympathetically told him that one could go insane from worry. These were the steps: fear of disgrace, fear of financial collapse, fear of insanity. But did the patient know all this? Not he. He knew only that he was nervous, that he suffered, and that he did not feel sure of himself.

A lovable old general, who had gone into the Civil War a private and served throughout the conflict with the greatest distinction, was sent to me because he was quite a nervous wreck. Twenty-five years before he had strained or sprained his back. The next morning he fainted and then rapidly developed what was called "spinal irritation." From this he suffered for many years, but finally made a relative recovery under the skilful guidance of Dr. S. Weir Mitchell. About four months before he came to me a saddle had turned with him, giving him a rather severe but (physically) not serious jar. At once all the old trouble returned. He was nervous and sleepless, and complained of pain and great weakness in the back. He never went out without a queer-headed cane which he could use as a support for the spinal column the moment he stopped walking and had to stand. The whole trouble was fear, vague as to object but very definite as to intensity. At first I did not tell him he was scared sick because he would not have believed me and I should have lost his confidence. But a course of training with the temporary use of bromid rather rapidly put him on his feet and made him comfortable; and he left for his home about twelve hours away. Unfortunately he took a road he never had traveled on, a rough one. The jarring not only disturbed sleep but started little "fear thoughts" about its possible effect on his spine. These worries kept him awake the next night, and in a panic he hastened back to Chicago. Even then he was so far from knowing that he was afraid that I had to explain to him the steps by which he had become the victim of fear, and clinched it by saying, "In short, General, you were a d—d coward." And this was true, although addressed to as brave a soldier as ever led his men. In other words, that a man is as brave as a lion is no reason why he may not have a paralyzing fear. He may be utterly devoid of fear of many dangers and sick of fear of one other.

A mine manager from Mexico came to be injected for trifacial neuralgia. And he made a big fuss every time I introduced the needle. As he said, "That little needle 'gets my goat'." At this time there were serious labor troubles in Colorado, and I happened to ask him if his labor was organized. He said it was not, but that once three labor organizers walked into his office and announced that they were going to unionize the mine. "What did you do?" I asked. "Kicked them out so quick they didn't know what had happened." "But," I said, "they might have shot you up." "Shoot up h—l," was the reply. "They didn't have time." That is to say, the revolvers of three aggressive labor leaders didn't "get his goat" at all.

This case is analogous to the phobias and, like the four preceding, illustrates a rule applying to many of them. We fear the unfamiliar; the things of which we are ignorant. All his life my patient had been used to tough men with pistols but not to physicians' instruments. German students are timid about bare knuckles but not a bit afraid of the Schläger that hacks their faces to pieces. The boldest financier may be inexpressibly scared about his liver. The one almost universal fear of the human race is Hades, or what follows death — the one thing of which we all know absolutely nothing.

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* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. This does not mean so-called psychanalysis. In this paper the tenets and methods of the freudian school are not taken into consideration.

2. His explanation of "talking them out of it" is not devoid of psychologic interest, and also shows how undisturbed he was. Essentially it was as follows: "Well, you see, the longer a man talks the less apt he is to shoot, and I got them to talking. And then, of course, they knew I was a crack shot and that if they made a move I'd be pretty sure to get one of them and maybe two before they could get me. And each of 'em kind of hated to be the first one."

But to this rule there are notable exceptions: exceptions which show what a fundamental and powerful emotion fear is, what a primitive race we are and how we still are largely controlled by instincts and emotions: not by knowledge and judgment.

A physician I never had seen hurried into my consultation room gasping for breath in a peculiar way. His mouth was open and he was taking quick, very deep inspirations at not too frequent intervals. Often he placed his hand over the precordium. It was easy to see that he was not in pain and had no organic dyspnea. He asked me to examine his heart. I asked him who had already examined it. He named half a dozen men more competent than I to pass on it. All had pronounced it normal. I declined. The man himself proved to be a competent and intelligent practitioner. A few years before he had run at top speed about half a mile to catch a train. He just caught it, clambering onto the rear platform as the train gathered headway. Of course he was out of breath and his heart was beating violently. At that moment came the thought: "What if I should have an acute dilatation now and here with no possible help?" The thought was terrifying, and he was in acute distress until he reached his destination, a short distance away. That was the beginning of a series of periods when the fear of heart failure would get the better of him, and in many of the attacks he breathed as when I saw him, the feeling being that the air did not go deep enough, did not reach the right spot.[3] There were times when every afternoon from 2 to 4, under one pretext or another, he would sit in a nearby drug store because he knew that then none of the physicians of the neighborhood had office hours; all were out making calls. And he just had to be where he could get quick assistance if necessary. If he were called to a house beyond the thickly settled districts he could not compel himself to cross the vacant spaces, but would turn about and go home, all because of the fear of sudden heart failure, his own knowledge and experience and the confident assurance of numerous heart experts to the contrary notwithstanding.

To state the thesis another way, intellectuality seems to be no effective protection against phobias. It is largely a question of temperament. The intellectual and cultivated are quite as susceptible as the stupid and ignorant.[4] And regarding this temperament one may frequently make a most interesting observation of what at first sight looks like a psychologic paradox. Concerning these phobia patients one very often hears members of the family say, "She never gives up," "Nothing discourages him," "He's a hard fighter," "She's full of courage and patience," and the like. All of which is perfectly true, and yet this person is in the clutches of an overpowering fear. The explanation lies in the nature of the individual. They are the people dominated by an idea. The absolutely undaunted young football player, who plays a whole period after he has been so battered that he is practically unconscious, does so because he is possessed by the idea that he's got to win and he's going to. The same boy may be just as much in the grip of an idea that he is ruined by masturbation. The mother who is absolutely tireless and never loses courage in the nursing of her child, because she feels that she must and will save it, may be just as strongly possessed by the fear that she may suddenly lose control of herself and cut the child's throat. The born enthusiast makes a fine phobic. Had her obsession taken another direction, Joan of Arc would have made a beautiful case of *folie du doute* or of agoraphobia. Martyrs and profound psychasthenics are often made of the same stuff.[5]

To insist that one should be careful not to confuse phobia with impulse, the fear of doing a thing with a sudden desire to do it, would seem to be a work of supererogation. But patients themselves frequently make this mistake, and physicians sometimes follow their example. One of the best English textbooks on insanity cites in some detail a typical case of phobias as one of homicidal impulse. Brief mention of a few cases will make the type clear:

A woman of 50 years habitually sat in a far corner of the room because she said she had an impulse to throw herself out of the window. I had the greatest possible difficulty in getting her to approach the window of my office (ninth floor) because of her overpowering fear that she might suddenly lose control of herself and jump out. She went toward the window haltingly with tense muscles and anxious countenance and clinging frantically to a heavy desk, as if some one were shoving her toward the window and she resisting.

A gentleman came to me in great distress of mind because he said he had an impulse to kill his two young sons. He had given away his revolver, had carried an ax about a mile away and thrown it into a river, and had disposed of the domestic clothesline in the same way, having had permanent wire put up in its place; all because the idea how easily he could kill the boys kept recurring with such intensity that he feared he might in some way suddenly do it.

A very devoted mother was in the same horribly distressing state of mind regarding her two little girls. She never went into the kitchen because the carving knives were there, had all meats carved in the kitchen, and persuaded her husband to take his razors out of the house—this because she was constantly in mortal terror for fear she might suddenly have an overpowering impulse to harm the children. What she came complaining of was nervousness and sleeplessness. Only after close questioning did she tearfully confess to an "impulse to kill the children."

A frequent fear, which the patient looks on as an impulse, is that of doing some mal apropos thing in public; of using obscene language or yelling or slapping someone or making a suggestive movement. Frequently such fears are really fear of insanity, of suddenly losing self-control. But the conception of the dreaded act recurs so constantly and forcibly that the patient gets the idea that he has a tendency to commit it, and the doctor takes his word for it. Needless to say, the diagnosis is vital for both prognosis and treatment, but is generally very easy. The patient at once acknowledges that he does not want to do the thing, never did want to do it, and has no reason for doing it, but fears that for some reason in some way he may suddenly have an abnormal impulse to do it, and will not be able to resist the impulse.

An interesting type of case, and one frequently misunderstood, is that in which the patient suffers from the physical results of the fear, but is quite unconscious that his trouble originated in fear and really still is a definite fear. As indicated before, these cases are very common. Sometimes it is easy to unearth the fear and its origin, sometimes difficult and occasionally impossible. An easy one was the following:

A young commercial traveler consulted me because of nervousness which came on in restaurants and hotel dining rooms. He dreaded to enter such a place because as soon as seated he became shaky and apprehensive, and had palpi-

3. This sensation is frequent in neuroses involving ideas of the heart, lungs and throat, and some others.

4. An intellectual and cultivated person may not be in the least "matter-of-fact." That he may be lacking in "common sense" is notorious.

5. I have recently seen a successful theological teacher and evangelist who was a missionary in darkest Africa where he heroically endured great hardships and undismayed faced manifold danger, yet now was suffering with an overwhelming fear of closed places.

tation, precordial distress, soon followed by nausea and cold perspiration. For three months he had been unable to take a meal in a public eating place, which meant that he had been unable to work for that length of time. Only a few minutes were needed to learn that some months before, in a restaurant, he had been taken violently ill with nausea and profuse emesis followed by active diarrhea and marked prostration; probably ptomain poisoning. This most disagreeable if not alarming catastrophe was unconsciously associated in his mind not with something he had eaten but with his presence at table in a restaurant, and it was fear of a recurrence of the thing in a public place, surrounded by people and no doctor near, that caused his symptoms. Although the patient had had no suspicion that he was afraid, he recognized the logic of the situation when it was presented to him, and made a rapid recovery.

Not quite so simple was the following:

A gynecologist sent to me a young married woman with vaginismus. She had been married many months, but coitus had not been completed. No cause was obvious. The introitus was normal and not especially sensitive. The patient had no prudish notions regarding intercourse, was deeply in love with her husband and anxious to fulfil her functions as wife and prospective mother. Detailed inquiry seemed to show that the trouble was not so much local pain as instinctive resistance and overpowering inability to endure the act. I further found that not only could she not endure to have the husband touch the pudenda, but even his touching the breasts caused a very disagreeable sensation with a strong feeling of defense. The cause of this great and greatly regretted repugnance was totally unknown to the patient. She never had been assaulted, nor had any such case impressed her. She never had had any disease or injury of the genital region or of the breasts, nor to her knowledge had any of her relatives or friends had any such trouble. The same applied to operations in these spheres. She did not remember reading anything along these lines, nor had any one told her disconcerting tales of the nuptial bed. But when finally I asked her if she had ever seen pictures that impressed her, she quickly recalled that when about 11 or 12 years old she had seen in a foreign gallery paintings depicting the breasts of women being slashed, the nipples seized with red hot pincers and the like. These had made a deep impression on her. And at just that time her mother had talked to her and her sister about the horrible consequences of masturbation; had commanded and besought them never under any circumstances to so much as touch the genitalia. Here lay the foundation of the hidden fear and repugnance; a fear which had existed for years, of which she was quite unconscious, but which still was effectively potent. Treatment was brief because recovery was rapid.

Of this type are many cases of agoraphobia or claustrophobia. The patient either does not know he has a fear or he knows only that he has an ill defined apprehension. What he complains of is simply that in certain places or kinds of places he is exceedingly nervous and has certain alarming sensations and physical signs. The principal ones are tremor (or a feeling of internal tremor), palpitation, precordial oppression, epigastric distress, great weakness, cold or hot perspiration, flushing of the face, "rush of blood to the head," and a feeling of dizziness and dyspnea (sometimes with tachypnea). Frequently great emphasis is laid on gastric or abdominal symptoms, and not infrequently the patient complains of uncertainty on the feet or staggering, which does not exist. Oftentimes such a patient when asked what he is afraid of promptly responds that he is not afraid of anything. Indeed, to deny fear seems to be almost as instinctive as that emotion itself. He may deny it with indignation, asserting that he is not afraid but that he is uncomfortable and sick. A couple of cases will illustrate.

A woman, aged about 60, complained of nervousness, palpitation of a peculiar dizziness or lightness in the head. She felt so uncertain of herself that she could not cross a large room unless some member of the family took her hand. Her most intimate friend lived just across the street, but she could not cross to see her. She had valiantly tried. She would hurry down her own front steps and start with a rush for the other side of the street, only to stop at the curb as at a stone wall, held by some force which she did not understand. She could walk along the curb to the corner, but the moment she tried to cross, she had a peculiar sensation in the head, precordial distress, became weak and trembling, and simply could not put her feet further. The thing was a mystery to her, but it did not take very long to ascertain that an attack of dizziness some weeks before, the sudden death of a friend from heart disease, and the cerebral apoplexy of another had combined to fill her with a fear that she might suddenly drop dead. The fear once definitely exposed, treatment was simple and quickly successful. Perhaps it is worth while to note the procedure. She was taken to a hospital, saw no visitors, first took short walks with a nurse beside her, and then with the nurse 20 or 30 feet ahead. Soon the nurse walked a short distance behind her, then on the opposite side of the street. Following this the nurse would stand on a corner while the patient walked to the next corner and back. When she could do this with complete ease and comfort, the nurse waited while the patient walked around the block. The rest was easy.

An active and successful business man was unable to cross the open space or common between Michigan Avenue and the station where he daily took train to go home. He always waited on the curb until other people were crossing. When he tried to walk the 150 yards or so alone, palpitation, precordial oppression, a queer feeling in the head, and great weakness stopped him. He knew that he was physically sound, and recognized his disability as irrational; he said he felt as if some one ought to give him "a good swift kick." But he had not definitely recognized his trouble as a fear that he would drop unconscious while crossing the open space, with no one near to help.

A few years ago I was asked to examine a man, aged about 40, with "paroxysmal tachycardia." I rather demurred, saying that heart cases were out of my line. But I did examine him and could find nothing abnormal. Nor did any amount of exercise through which I could put the patient cause tachycardia. Finally close questioning brought the statement that he could walk any distance at any gait without palpitation provided his wife were along, but that a leisurely stroll by himself would be sure to bring it on. At once I sent him out to try it, and he came back with a pulse of 140. Then for the first time I got at his fear which was the cause of the tachycardia.

Occasionally the physical manifestations are pronounced, although the patient knows perfectly well that a groundless fear is the cause. A good example is the following:

A woman, aged 42, well educated and unusually intelligent, had had since the age of 6 an overpowering fear of thunder storms. At that age she had suffered "a stroke of lightning." She was running home for shelter from the storm when just as she opened the door a bolt of lightning struck very near and she fell through the doorway onto the floor. Whether or not she received any electricity she could not tell me, but is said to have been temporarily paralyzed. In any event she received a great shock, possibly of fright alone. The timidity engendered by this occurrence was fostered by the parents, who allowed the child to take refuge in the cellar or in a dark closet whenever a storm approached. This astraphobia increased with the years. After a time a thunder storm caused not only a feeling of apprehension, oppression, tremor and palpitation, but also nausea and later violent vomiting and retching. In the meantime the patient had developed grave organic heart disease. When she came to me the situation was serious, inasmuch as the strain of each attack of vomiting and retching was more than the heart could

compensate. Here, then, was a case in which the physical effects of a phobia were actually dangerous to life, although the patient quite well understood the nature of her trouble. I may add that in this case the nervous symptoms, at least the nausea and vomiting, were entirely controlled by means of hypnotism.

As has already been intimated, properly to elucidate a case of phobia, manifest or latent, generally one must go back to the very first appearance of the symptoms and investigate the circumstances surrounding it. In most instances the mechanism is quite simple. The patient has had some distressing or peculiar sensation or some disability from adequate physical cause. This sensation he at once or (more often) subsequently correlates with some serious malady or calamity which in some way has been brought to his attention. It goes without saying that the patient has as prerequisite a hypersensitiveness or impressionability. Consequently, often a very small trauma suffices. From my cases I note as the initial disturbance: ptomain poisoning, tobacco poisoning (excessive smoking), dizziness or syncope from overheated and overcrowded rooms, alcohol poisoning, the weakness or trembling from typhoid or other acute illness or following confinement or an operation, heat stroke, discomfort from excessive eating, rheumatism, aural vertigo (quite a number), tinnitus, syphilis, nocturnal emissions, the shock and hemorrhage of initial coitus, cerebral thrombosis, migraine, the distress of hyperacidity or indigestion, uremic convulsions, night numbness or night palsy, and predormal shocks.

Some phobias are very like the antipathies harbored by many people (for instance, for cats), so well depicted by Weir Mitchell and others. Such phobias may be hard to account for, as are the antipathies, but some are relatively simple. The following case is unique in my experience:

A woman, aged 27, could not bear to look at the sun, moon or stars, and was most uncomfortable whenever she thought of them or heard them mentioned. She never went out of the house at night unless compelled to do so, and would not even look out of the window. On a bright day she preferred to stay in with the shades drawn. She had become so worried and nervous that life was a burden to her and she a burden to her friends. Whisky gave her some relief, and at times she indulged to excess. As may be supposed, she had always been sensitive and timid about many things. In addition, she had been a spoiled daughter until she married an indulgent husband. On this basis her trouble developed as follows: At the age of 10 she had been in a tornado which she thinks did not frighten her excessively but left her afraid of storms. A year later her mother in great agitation awakened her and told her to dress quickly as another tornado was coming. Apparently these events left her very timid as to Nature and afraid of the dark. At 22 she married and went to live on a ranch, the nearest neighbor being 15 miles away. Here she was lonesome and rather unhappy, evidently oppressed by the isolation, the vast stretches of lonely range and her own impotence. A year after marriage a man came along with a newspaper telling that Halley's comet was about to appear and detailing all the horrible catastrophes said to accompany its coming. This recital had the immediate effect of giving her a nervous chill. She went to her room and took a big dose of whisky, but could eat no supper and could not sleep that night. This fear of celestial calamity rapidly developed into fear of all heavenly bodies; a fear which would seem to belong to the middle ages, but which did incapacitate a rational human being of this twentieth century.

One particular fear I wish to mention, as it is not uncommon, but frequently is unrecognized, principally because of the reticence of the patients. So far as I know it has not been named, but might be called hierophobia. I refer to a fear afflicting clergymen in their public functions. Oftenest I have seen it in Catholic priests whose duties about the altar are more complicated and solemn than those of a protestant preacher in the pulpit. Another reason, I believe, for its greater frequency in the Catholic clergy is that they officiate fasting, and the primary attack has been induced by the faintness of a man working on an empty stomach and who perhaps has slept poorly, has been up most of the night, or has been smoking excessively. In nature it is just like other phobias. For some casual physical reason the patient experiences a faintness or dizziness, or a tremor or palpitation, or something which suggests to him that he might lose control of himself and do something unseemly or that he might lose consciousness or have a stroke. One patient noticed that in administering the sacrament his hands trembled. This begot two thoughts: first, that his parishioners might think he had been drinking (he was quite rubicund but very temperate); second, that he might blunder and spill the host or the sacramental wine. This patient, like most of the others, complained not of his fear but of general nervousness, tremor, poor sleep, head pressure, etc. Methodical and patient investigation was necessary to extract the kernel of his trouble and show it to him.

To consider the treatment of these cases forms no part of my present purpose, but I will allow myself two remarks. First: The remedies most frequently prescribed for these disorders are absolutely futile except for possible suggestive value. How can "tonics" or "sedatives," change of climate, a vacation, tacking up a floating kidney, lifting up a prolapsed uterus or rest in bed and massage eradicate fear? Would a winter in Florida, a trip around the world, an operation for hemorrhoids, or strychnin pills make a sinner less afraid of eternal punishment? Second: The way to remove fear is to show the patient what it is and then teach him to demonstrate to himself that it is groundless. In short, educate him out of it as he has been inducted into it. If a child is afraid of a dark room we do not give him soothing syrup and tell him there is no room and no darkness. Nor do we suddenly throw him into the place of dread. We explain the darkness and the entire absence of anything to be feared. Perhaps we light the room and then make it dark again. Then, when we are sure he is ready for it, we take him kindly but firmly by the hand and lead him into the dark room, or perhaps only to the door or part way in. Finally, he goes in alone, and when he has fully demonstrated to himself that there is nothing there to be feared, of course he is not afraid and he is cured. We are only children of a larger growth. And not so very much larger either.

25 East Washington Street.

ABSTRACT OF DISCUSSION

DR. FRANK PARSONS NORBURY, Springfield, Ill.: I am a bit disappointed in Dr. Patrick's paper in that he did not go into the psychology of fear more extensively. I always look on this subject as one belonging to psychobiology, involving questions of survival, self-preservation, primary emotions and instincts. If we look at it from this viewpoint it does not matter what is the fear, but the fact that that fear exists. And when you analyze fear on this basis, even without the details, and consider the essential, instinctive, inborn condition that is present, I think we will then under-

stand the whole fear habit of man. Of course, we must ascertain what is the fear. The question of survival is always paramount and the individual is put on the defensive by the emotion of fear. True, that is according to what fear stimulus may exist. We should consider that fear is not limited to any one condition, but that it is a tendency, like all physical traits, involving all of us alike. Just as hunger is not limited to any particular desire for food of a certain quality, but the question is that we desire food, and this involves all centers and all cells. And so it is in fear. When we have fear the reaction is fear alone and involves the stability of all cells. It is therefore a question of biology and in consideration of the subject fear we should start from that viewpoint.

Dr. Patrick apologized when he mentioned the freudian doctrine. To me this is an essential question. In my judgment it is more than Freud's emphasis on the sexual instinct. We should call it the freudian wish, in which is involved the essential determining factor of life itself, at least in life preservation. The question is one requiring full elaboration of all the psychobiologic phenomena. And for that reason, when we take into consideration the fact that we are dealing with primary emotions and instincts, with the laws of survival, we have a rational basis for procedure. There may be an association test that will strike real fear, the elements that are concerned in the foundation of the complex, because fear is the root of many of our intellectual strivings. It is the strife which brings about adjustment and when you know that, you are readjusting and reeducating the personality. The essayist speaks of educating the child to go into the dark. If you get down to the primary analysis of why the child is afraid of the dark and show that it is an element of survival and of self-preservation, and then treat the question from the standpoint of what are the primary instincts, you will by this means get a better answer. You have to make an explanation. The child is seeking an explanation; he is looking for an answer to his instinctive reaction to his fear, just as you or I would in any other reaction. This is normal; it is a stage in development and an onward movement in individual development of personality. The fact of the policeman being not afraid to meet the criminal alone only has value as an evidence that he has adjusted himself to such fears. This is the biologic consideration of the question. The other reaction to fear is only of importance because of the fact that he has a fear.

DR. HAROLD N. MOYER, Chicago: Dr. Patrick said that it was a work of supererogation in this organization to separate impulse and fear and explain the distinction. I do not believe that is true. He tells us that the freudian doctrine is not essentially sexual, but here we are confusing the two things again, fear and impulse. And that is the point. We are afraid of the freudian doctrine, we fear that it is complicated by a sexual impulse. We do not want to be charged with the latter, hence we are afraid of the former. That is the doctrine. I suppose that within the month hundreds of people are sent to institutions for the insane with the statement that they are not only insane, but that they are suicidal. What is the basis of that statement made in their committal papers? Why, they have confessed to the doctor or to the examining magistrate or to somebody that they were afraid they would kill themselves. But they never intended to kill themselves—they were *afraid* they would. It was simply a morbid fear, they were not suicidal at all. A man quietly puts away his razor for fear he will kill somebody, hence in the papers regarding commitment he is put down as homicidal because he is *afraid*, he says. That is the common misconception—the relation of fear and impulse.

DR. ROBERT MCGREGOR, Saginaw, Mich.: The emotion of fear must always naturally arise from an instinctive basis. Its reaction is as forceful and uncontrollable as a reflex. I believe that fear of a vague and unreal kind plays a potent part in many of the manifestations of hysteria. For example, I knew of the case of a strong, husky farmer who stiffened out in a tonic spasm while the dentist was applying the rubber dam. Two days later he returned, reinforced by a couple of his neighbors, when he went through the ordeal without a hitch. The remedy in the young subject is disciplinary and educational, along the lines of rendering more stable the emotional equilibrium.

DR. WALTER B. CANNON, Boston: The emphasis which Dr. Norbury has placed on the biological aspects of this discussion is well deserved because of the fundamental character of these emotions and the instinctive impulses that attend them. Dr. Patrick is, I believe, doing an important service in calling attention to the significance of these fundamental experiences which human beings share in common with the lower animals. During the past four or five years we have been studying the effects of fear and of aggressive feeling in lower animals, and the results obtained have rendered the suggestions which Dr. Patrick made today particularly interesting to me. He pointed out the very close association between courage with readiness for aggressive action, and a fear which likewise came on with great intensity. If you study the reactions that occur in lower animals either from fear or from intense aggressive feeling, you will find that they are essentially the same. All the changes noted—increased heart beat, inhibition of the movements of the stomach and intestines, liberation of sugar from the liver, increased blood pressure—occur either in fear or in rage, so that basally the biologic changes are alike. And there is good reason why they should be alike, because in either case, whether there is fear present because of danger against which the organism has to defend itself, or whether there is aggressive feeling which will result in attack, the organism has to engage in a struggle, a struggle which may mean life or death to it and consequently will call for the mobilization of all its forces. So there is abundant reason why, under the circumstances referred to, these changes, all of which are favorable to the mobilization of the abilities and activities of the organism, should then occur as reasonably in fear as in anger or rage. James years ago pointed out the very close relation between fear and anger. He remarked that we both fear and wish to kill anything that may kill us. And it seems to me that if we regard these emotions and the instincts that are associated with them *biologically*, and apply the biologic concepts to the peculiar instances and circumstances that may arise in particular cases, we may often get an illuminating insight into their actual operations.

DR. TOM A. WILLIAMS, Washington, D. C.: There is great confusion in this whole question. Of course, fear is a biologic reaction; of course, there is a physical mechanism; of course, we cannot arrest it by attacking the physical mechanism. Let us analyze the matter. There is first a reaction, what we call the manifestations of fear, physical and psychologic. The cause of that in all cases from the lowest biologic organism up to the human being is a sentiment, a feeling, an apprehension of danger. The cause of that is a concept always. Because of that concept there is a percept of the situation. It is because of what we fear that makes us fear. Then it is only by reason of the removal of the primitive active factor of the fear that we can remove the fear. We cannot remove the fear by dealing with the ultimate mechanism. Therefore, the question is a psychologic one, and we must find the active percept which in each particular case produces fear. But the same situation does not always produce fear in every individual. Why? Because in each there is a different set of conceptual processes causing fear, and it is those which we have to attack by exploratory analysis. The only exploratory analysis is not freudian analysis. People were cured of these troubles long before that doctrine was known.

Dr. Cannon has shown how it is the concept which determines fear in the lower animals. All of us who have taken the opportunity to examine committal cases have found this to be true, and the mechanism by which the deviation from normal reaction occurs we can call what we like. I call it suggestion, which simply means a false appreciation of the situation, a lack of placing the situation in its true relationship to life as a whole and to the individual himself. It is true that certain individuals are more apt to deviate in that way. We know that certain individuals are nervous,

easily intimidated. One reason is the physiologic tendency toward the fear reaction, and the other is the environment. And it is this that we can, perhaps, influence. We can get at the way in which this individual reacts by going back to the childhood influences and environment, and readjust the mental attitude toward life, by this means suppressing at the inception the reactions which would otherwise eventuate in fear. Many cases of that kind have been published to show that these matters can be readjusted quite independently of the methods of the freudians. It is only because the patient cannot explain all the things that create the fear. It is not that he does not know that it is fear. He does not call it fear; he does not recognize the similarity of the reaction to his fear, but when placed face to face with the psychologic features of his own case he recognizes them as not derived fundamentally from fear. Hence even in Dr. Patrick's cases I believe there is no really unconscious mechanism, in which respect I think we can part company entirely with the freudians.

DR. WALTER B. SWIFT, Boston: I have done work along this line in connection with stuttering. In cases of stuttering we have found that a great many fears precede the utterance. Those fears are manifested through the utterance where stuttering is present, and many times follow afterward. The treatment that has been applied very successfully to these cases is what is called the supplying of a visual image. By this I mean that during the stammering process the visual image, that is normally present in talking, is absent. Therefore, by training these stutterers to visualize automatically during talking, their fear vanishes and their stuttering improves. I think that these fears in a general sense often come from false instructions and from interpretations of older people who have drilled them into us in our early days. Therefore it would seem that the general method of eliminating fear in these cases should be to supply automatic visual images. Cure results.

DR. C. B. BURR, Flint, Mich.: It is true that those patients fear the unfamiliar, as Dr. Patrick has said, but they also fear the familiar, as witness syphiliphobia. A distinct delusional state occasionally is determined by harking back to a genuine or supposed infection.

DR. FOSTER KENNEDY, New York: I want to point out something which in the practice of psychanalysis comes under one's observation in the day's work: That the whole theory of symbolism as enunciated by Freud, whether or not it be true, in the practice of the disciples of Freud, is used as mechanically as would be a set of chemical analytic tables. The details of Freud's symbolistic theories are as ex cathedra as are the enunciations of Mary Baker Eddy, and are accepted equally implicitly by the followers of the two systems of thought. In practice this has led not to the careful detailed personalized examination of the individual under consideration, but to a request for symptoms and their automatic pigeon-holing on a basis of preconceived data of purely pontifical character.

DR. FRANCIS RHODES FRY, St. Louis: There is no place for the freudian intrusion in any serious sense in the practice of medicine and psychiatry. It has been my observation that a phobia is often sustained by some point of irritation or distress in the patient's periphery, so to speak. In that class of cases, particularly, it does not do to remind the patient too soon that his trouble is psychic.

In a recent paper on the anxiety neuroses, the peripheral as distinct from the psychic side of these cases was my chief theme. Very often the fear patient has an anxiety based on a peripheral irritation constantly suggesting to his mind that something is wrong somewhere in his system. It is well to work seriously to correct possibilities of this kind. In other words, to begin something that looks like a campaign in the patient's interests. I have seen many patients affronted and driven away by the first interview with a practitioner, who has simply said, "Nothing the matter." Of course, such practitioners are generally not good enough psychiatrists to grasp a situation of this kind.

DR. CHARLES R. BALL, St. Paul: I think we can say of the freudian doctrine that it has some elements of truth, but because of these few elements of truth it is not necessary for us to be compelled to swallow the whole thing. I believe absolutely in Dr. Patrick's and Dr. Williams' exposition of this subject: That correction must be along the lines of readjustment of the patient's ideas. With these patients we should do as in other affairs of life, "Show them." And still that is not all, because there is a biologic factor. It does not appear so plainly in the nervous cases as in the mental. I remember the case of a man with manic depressive insanity and with a fear of suicide. When I saw him his tongue was furred, he was losing in weight, there was lack of appetite, disturbed sleep, and he went on getting worse until one day while sitting in his office he did attempt suicide. He made a vicious slash at his throat, cutting himself from ear to ear, and slashed the arteries of his wrists, but fortunately did not kill himself. From that time on his fears left him, his tongue immediately cleared up, his sleep came back, and mentally he was himself again. This case illustrates the biologic side—that there is something which brings about those conditions in addition to ideas. I can recall a number of cases of this character where some great shock or perhaps some other fear has immediately relieved a manic depressive condition and suicidal tendency.

DR. ULYSSES GRANT DARLING, Chicago: It appears to me that in the elimination of fear, whether it be in animal or in human being, the greatest point in the cure is to give the individual the experience of the feeling of safety. It is not always necessary to be so very scientific or to follow after any particular hypothesis in the analysis of the individual. It also appears to me that the doctor, whether from a scientific standpoint or from an artistic standpoint, who is equal to the occasion at the moment of interview of discovering a method of giving his patient this experience, will have gratifying results. In the analysis of any morbid fear it must be an analysis that reaches that particular fear, and then we must be capable of giving the treatment which, after a clear-cut diagnosis, will have a particular bearing on the case in hand.

DR. DAVID S. BOOTH, St. Louis: I am unable to reconcile the view of the essayist on the treatment of fear with a fear which I will have to personally acknowledge in order to explain it. I have a fear of snakes and lizards, which I know is unnatural, although I realize that there is no reasonable basis for this fear. When a boy I had a classmate who carried them in his pockets and played with them and I know from knowledge of natural history that there are very few dangerous snakes. Even the imitation wooden ones make me "creep," and I also had that kind of "snaky feeling" when I used the ordinary earthworm used in fishing. Nothing of the kind has ever attempted to harm me, I have never been frightened with those things in any particular manner only in running onto them as boys naturally will in play. But I will admit that I can hardly look at a snake or lizard until after the initial feeling of fear has passed off, when I am able to kill it. I would like to have some freudian explain why I cannot get over this feeling.

DR. HUGH T. PATRICK, Chicago: Dr. Aikin has handed me a written suggestion, as follows: "Please emphasize the value of personality and our complete analysis of each patient as an individual and not a machine, as one in 10,000 made in the same mold." I cannot make it any more emphatic than that. To Dr. Norbury, I can only say that because I omitted to discuss the psychology and the biology of fear, I do not wish to be understood as not being entirely in accord with him and Dr. Cannon. In my paper I speak of fear as one of the fundamental things in us, and I illustrate the fact that we are controlled by our primitive emotions and appetites; not by reason, not by our intellectual processes at all. In a way I have said that there is some physical cause to start this thing. Of course, that might have been a transient physical something or it may have been a continuous physical something, and if there is a continuous physical something which the patient fails to interpret properly, naturally it perpetuates the fear. And if we do not find out his error and correct it we have not done our duty. Then there is the next step, which Dr. Darling

also alluded to, and which I should like to put perhaps very crudely in this way. We can scarcely be said to treat a psychoneurosis; we are working with the individual who has it. And I believe that in some instances the object should be—I say this with great deliberation—the object should be, not to give the patient the true explanation, which is to be preferred and in the majority of cases is the better procedure, but to give him an explanation which satisfies him; which appeals to his particular mentality, to his particular viewpoint, which harmonizes with his past, his education, his environment. And I thoroughly believe that some of the successes of the freudians have been attained not because they have found the truth, but because they have done something which begot confidence, which presented to the patient what for him was an adequate explanation. If we can make the patient *sure* that we understand, and if we can make him believe that he understands, it does not really make any very great difference whether we have reached the bottom of the psychology of fear in that individual or in the race—we have accomplished our object with that individual patient.

One symptom spoken of was the vague indeterminate sensation of fear. What I have tried to make clear is that most of these fears are not vague and indeterminate at all; they are perfectly definite, individualized fears, each one of which we can get hold of and bring to the surface so that we and the patient himself can recognize it.

HETEROPHORIA IN CHILDREN *

WENDELL REBER, M.D.
PHILADELPHIA

Heterophoria in children is a reasonably rare anomaly. The references to it in the literature are of the most cursory kind. Of statistics there are none. In the hope of establishing some kind of statistics I have had my private case records gone over with the following results: In the last twenty years, refraction was done in 6,400 cases. Of this number, 2,000 presented some manner of muscular anomaly. Many of the latter class were made so comfortable by their refractive correction alone that no especial attention (except for purposes of record) was directed to the muscular anomaly. Of these 2,000 muscular anomalies, representing all ages, 345 occurred in children up to but not including the fifteenth year. Of this 345 there were thirty-five, or about 10 per cent., whose muscular status became of moment and demanded treatment for the muscular condition itself. This has no reference to strabismus in children, which is familiar to all ophthalmic workers. The cases herein referred to were true heterophorias in that the children all enjoyed binocular vision, but were sufficiently hampered by their muscular imbalance to present quite an array of symptoms.

The figures submitted would indicate that one in 183 of all refractive cases will represent a child with an essential heterophoria, and that one child in ten that exhibits muscular imbalance will need some manner of treatment for its abnormal muscular status. There are doubtless those who feel that if these children had been given a good refractive correction and then had thoroughgoing attention paid to their general physical condition, there would have been no need for treatment of their muscular imbalance. It might, therefore, be stated here that in every one of the cases to be recited, the most careful correction of the refractive error was done and every other possible source of reflex irritation removed before treatment was directed to the abnormal state of the ocular muscles. The relief of symptoms in all but three of the cases was striking. Children ordinarily possess such vigorous nervous systems that they experience very little trouble with heterophoria. When they do, therefore, the muscular imbalance becomes of considerable moment and is well worthy of attention. Moreover, binocular stereoscopic vision is not always a thoroughly established function in children up to 12 years of age, and the presence of a considerable hyperphoria might well be the one factor necessary to disrupt this complex function, as I have had occasion to observe in a fair number of cases. Analysis of the thirty-five cases here reported affords some interesting facts.

Of the thirty-five cases, eight presented esophoria and twenty-four presented exophoria, two presented uncomplicated hyperphoria and one presented anaphoria. Altogether there were seventeen cases of hyperphoria; but as fifteen of them occurred with either esophoria or exophoria, they will be dealt with separately. The most outstanding fact in the foregoing figures is the preponderance of exophorics—twenty-four of them as against eight esophorics. It has been thought that esophoria is the usual muscle status encountered in children up to the time of puberty, and I am still of the belief that in 100 children taken consecutively this would be the case. It would appear, therefore, that the predominance of exophoria will be found only among those children who have symptoms referable to their ocular muscles.

The presence of fifteen cases of hyperphoria in thirty-five cases of muscular imbalance in children is also a noteworthy finding. This represents 42 per cent. of all the cases. Heretofore we have thought that hyperphoria was a muscle status to be seen mainly in adults and largely in those over 30 years of age. In a paper on hyperphoria presented before this section in 1900, I found that out of 150 hyperphorics, 116 were found after the twentieth year, so that this pronouncement will have to be somewhat modified.

Study of the relation of the muscular status to the refractive status is not without interest, as the following figures will show:

RELATION OF MUSCULAR STATUS AND REFRACTIVE STATUS

	H+Ah	Ah	H	Ahm	M+Am	Am	M	Amh
Esophoria	5	..	1	1	1	..	..	..
Exophoria	17	3	..	1	2	1	..	..
Hyperphoria	9	2	1	1	2	..	..	..
Anaphoria	2	..	..	..	..	..	..	..
Hyperesophoria	3	..	1	1	1	..	..	..
Hyperexophoria	5	2	..	..	..	..	..	..

Of the eight esophorics, five occurred with H + Ah, one with H, one with Ahm and one with M + Am. This is in accord with the usual conception that compound hypermetropic astigmatism and its congeners are likely to have esophoria as the associated muscle status.

When we come to consider the twenty-four exophorias, we find that seventeen occurred with H + Ah, three with Ah, one with Ahm, two with M + Am, and one with Am. In other words, out of the twenty-four cases of exophoria, twenty-one had H + Ah or its allied states as the refractive status. This is a most interesting finding and one of great gratification to

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

me, as it bears out the contention I made in a paper[1] before this section at the 1906 session at Boston. In that paper I analyzed the findings in 441 cases of exophoria in adults, and found that 319 of them, or 72 per cent., showed H + Ah and its allied conditions as the refractive status. The statement was there made that we should have to abandon the old conception that exophoria was to be mainly found associated with the myopic varieties of refraction. In these children, then, we find that in twenty-one out of twenty-four cases, or 87 per cent., of exophoria, the hypermetropic status prevailed, and it seems more firmly established than ever that we cannot predicate from the refractive status what the muscular status is likely to be.

If it be argued that the presence of hyperphoria might possibly account for the large percentage of exophorias in these children, I would rejoin that among the fifteen hyperphorics, seven presented exophoria, six presented esophoria, and two were simple uncomplicated hyperphorias. Whether these twenty-four exophorias were anatomic or innervational in origin, I am not prepared definitely to say. It is significant, however, that in the eight cases in which the tropometer readings were taken, the nasal rotations were absolutely normal, so that there is much presumptive evidence that the innervational factor is the main one, all of which goes to show that the relation between accommodation and convergence is a most elastic one. The ideal (or academic) relation between accommodation and convergence that obtains in the absolute or relative emmetrope (namely, as many diopters of accommodation as there are meter angles of convergence) is none too frequent. Nature is abundantly kind and even diplomatic. For each one with binocular stereoscopic vision she provides some manner of relation between accommodation and convergence. For the hypermetrope of 2 diopters, for the myope of 2 diopters and for the astigmatic of 2 diopters, Nature devises some kind of working relation between accommodation and convergence that is for them the best thing at that time, until some ophthalmic worker wisely affords a better one that more nearly approaches the ideal emmetropic relation. But even with the kind of artificial help afforded by a good correction, not always are the ideal relations established. Not always do the ocular muscles quiet down and fall into correct habits. In the thirty-five children here to be considered, there were residual symptoms of ocular distress in spite of the refractive correction, and these residual symptoms compelled extra attention and aid.

The diagnosis in these various muscular states was based on tests with the Maddox rod (for distance and 13 inches), the cover test (for distance and 12 inches), the ductions, the tropometer readings, and in vertical cases careful study of the binocular motor field for diplopia. Also, the action of the associated muscles in suspected pareses or palsies (congenital) of the vertical muscles was noted. In this way pretty accurate information was secured in every case but one.

Analysis of the esophorics showed that only three were uncomplicated. One of 8 degrees was given a ¾ degree prism base *out* in each eye and seemed perfectly comfortable with this treatment. Another with 15 degrees of esophoria has worn a 2 degree prism base *out* in each eye for four years with complete disappearance of a general nervousness that had worried his family for two years previously. Another of 12 degrees has worn a 2 degree prism base *out* for six years with complete disappearance of facial habit spasm and malnutrition that had baffled two pediatricians for some years.

The other five esophorics exhibited a hyperphoria that so dominated the picture as to compel attention. All of these five patients are wearing vertical prisms varying from a total of 2 degrees to a total of 6 degrees. One child broke down two successive years at school; but in the three years that she has worn a vertical prism, she has had no difficulty in completing each school year and issuing from it in good physical condition. The most suggestive case in this series was that of a boy of 12 with 20 degrees of esophoria and 6 degrees of nonparetic hyperphoria. A 5 degree vertical prism dispelled the esophoria in two weeks, so that but three degrees remained, and this was the status three years later when he was examined again. A conspicuous failure occurred in a girl of 11 with esophoria of 8 degrees and left hyperphoria of 3 degrees. Lateral prisms were poorly tolerated, and a 1 degree vertical prism accentuated her symptoms so sharply that it had to be removed. There were no pareses of any kind. Hysteria was ruled out, also all organic disease. This case remains a complete mystery to me.

In the exophoric series of twenty-four cases, seventeen were simple exophorics. Of these, three were practically emmetropic under a mydriatic. (That is to say, they were entirely free of astigmatism and exhibited plus 0.25 to plus 0.50 sphere under the mydriatic.) They were given prism training with prisms bases *out*, and their symptoms disappeared under this treatment alone. Eight were placed on prism training after wearing their refractive correction, and this was sufficient to make them perfectly comfortable. Three had weak prisms (from 1 to 2 degrees) bases *in* incorporated in their glasses, and did very well. These were children from whose parents I could hope for no cooperation in training them at home. Finally, three others had weak prisms of from 1 to 2 degrees bases *in* in their glasses, and in addition had vigorous training of their convergence with prisms (bases *out*) at home. The results were at least beneficial each time. Two had some residual discomfort in spite of the treatment.

Seven of the exophorics were complicated with hyperphoria. Five of these have worn vertical prisms for from one to six years, and will be dealt with under hyperphoria. Two of them were made so comfortable on prism exercise that no vertical prism was ordered.

The one case which stands out in the exophoric series was that of a boy, aged 9 years, with 5 degrees of exophoria for distance and 12 degrees for the reading distance. This boy had a typical cerebral type of vomiting for two years. Two ophthalmologists had pronounced his eyes as absolutely normal. Under a mydriatic there was no astigmatism whatever, and the total spherical error was plus 0.50 sphere. Three pediatricians had exhausted themselves in attempts to solve the trouble. Brain tumor, central organic disease, hereditary and acquired, gluttony, and all other possible factors had been successively ruled out. The last pediatrician in the case continued to assert his belief in the ocular basis of the vomiting, inasmuch as it was much more in evidence during the school year and much less so during vacation. The boy would vomit independently of mealtimes, and often would stop in the middle of outdoor play, have projectile vomiting, and then go right on playing.

1. Reber, Wendell: A Study of Convergence and Its Defects, THE JOURNAL A. M. A., Sept. 1, 1906, p. 670.

In view of the muscular status and because the mother was of low mental type and offered no hope of cooperation in prism training, the boy was ordered plain 1½ degree prisms bases *in* in each eye. For two weeks he was decidedly worse; then the vomiting suddenly stopped, and for three years, during which time he has gone through three school terms, there has not been the slightest return of the reflex. This is one of the purest instances of a gastric reflex of ocular origin that it has been my privilege to study.

Of the fifteen hyperphorias, two were simple vertical disturbances without lateral error.

One was in a school girl, aged 14 years, who came wearing a perfect correction of her compound myopic astigmatism. There was right hyperphoria of 2 to 3 degrees, varying from day to day. There was no diplopia to be elicited and there were no pareses of any of the vertical muscles. A 1½ degree prism base *down* in the right eye relieved the vertigo and malnutrition from which she had suffered for five years. In three years she has revealed latent hyperphoria so that now she wears a 3 degree prism base *down* in the right eye, and has completed her high school course in splendid physical condition.

The other occurred in a girl, aged 7 years, with congenital paresis of the right superior rectus revealing itself as a paretic right hypophoria of 6 degrees. When the eyes were rotated to the right, the left eye flew in and upward sharply. The head was always characteristically tilted to the right. This is the type of case on which Duane has laid so much stress because of the associated spasm of the inferior oblique of the fellow eye. I have often felt in these cases that there was also spasm of the superior rectus of the fellow eye. For instance, in this case of paresis of the right superior rectus, if the eyes are carried to the right, the superior rectus of the left eye (being a secondary adductor muscle) would throw in its quota of action, and with the left inferior oblique turn the left eye upward in spite of the action of the left inferior rectus, which would also try to assist in adduction.

Nothing would better serve to illustrate the complicated character of what would seem to be simple ocular movements.

As Dr. Hansell and I[2] have continually urged, there is no one movement of the eyes in any direction in which one individual muscle is the sole performer. An individual muscle may be the predominant actor, but never the sole actor.

To return to our case history, the child had a 2 degree prism base *up* in the right eye incorporated in her refractive correction (a very low compound hypermetropic astigmatism) and was almost instantly relieved of her intense nervousness, night terrors and malnutrition.

It is interesting to note that her tropometric readings were:

	Up	Down	Nasal	Temporal
R.	30	50	55	55
L.	40	35	50	50

The mother was so distressed, however, by the occasional sharp upward deviation of the left eye that I finally reluctantly operated on the child, doing an advancement of the right superior rectus and a tenotomy of the left superior rectus. One month later the tropometric readings were:

	Up	Down	Nasal	Temporal
R.	40	50	55	55
L.	35	35	50	50

Two months later there was residual right hypophoria of 2 degrees, and there is now a 1 degree prism base *up* worn in the correction of the right eye. But the up and in shoot of the left eye is no more in evidence, and the child is using her eyes hard at school. The head tilting has also disappeared.

If I have gone into considerable detail in the recital of this particular case, it is because it so perfectly illustrates the complex problem with which we are confronted in these instances of congenital palsy of the vertical muscles. Each one must be solved for itself, and aberrant phenomena on the part of the muscles not impaired in their action must be rather expected.

Of the remaining thirteen hyperphorias, six were associated with esophoria. In one of them the esophoria amounted to 15 degrees, the hyperphoria 1½ degrees. In this case the use of a 2 degree prism base *in* in each eye, and training of the ocular muscles, controlled the symptoms, and no attention was therefore paid to the vertical error.

In the other five, the hyperphoria dominated the condition, varying from 2½ degrees in the lowest one to 12 degrees in the highest one. Only one of these was paretic, and duplicated in most respects the lengthy case history just recited. No operation was done, however, as the parents objected and the girl was made comfortable with vertical prisms alone, as were the other four.

The seven remaining hyperphorias were associated with exophoria variant in amount.

In one of them the hyperphoria equaled 3 degrees, but there was also exophoria of 15 degrees. Vigorous prism training, begun with 5 degree prisms bases *out* in each eye, and carried up gradually to 20 degrees in each eye made the patient (a husky boy of 12) absolutely comfortable. The vertical error was naturally disregarded.

In three others the hyperphoria was low (not in excess of 1½ degrees), and prism training of the convergence, with weak prisms bases *in* for permanent wear, accomplished a complete cure, so that in these also the vertical error was ignored.

In the remaining three cases, the hyperphoria became an insistent factor demanding especial attention.

In a girl, aged 14 years, there presented an exophoria of 9 degrees and a left hyperphoria (nonparetic) of 5 degrees. One degree prisms base *in* in the permanent correction and prism training of the convergence was of no avail. A latent exophoria revealed itself gradually, so that finally there were 14 degrees of lateral error, her convergence viewpoint being 7 inches. At this point, modified tenotomy of each externus and of the left superior rectus was done with resulting exophoria of 3 degrees and left hyperphoria of 1 degree. Almost immediately a cervicobrachial neuralgia of five years' standing was completely relieved. The girl was passionately fond of music, but could not practice more than half an hour without becoming dizzy and nauseated. Today she spends hours at the piano without discomfort.

In the second case, a bright boy of 12 had been almost a nervous wreck for three years and had never been able to do any continued school work, but had always had a tutor. His exophoria was but 2 degrees for infinity and 6 degrees for the occupation distance. His right hyperphoria of 6 degrees was not paretic. A 3 degree prism base down before the right eye in his refractive correction transformed him in one year into a husky boy who could use his eyes for two hours at a time without the slightest discomfort, and after three years there has been no increase in the hyperphoria, or in the prism worn.

In the third case, a boy of 8 had been intractable for a year. He was choreiform, violent tempered and at night either walked in his sleep or had enuresis. No diplopia could be elicited in spite of his 6 degrees of left hyperphoria, nor were there any other signs or symptoms of paresis of any of the vertical muscles. In his eighth year he broke down physically and nervously at school. At this stage a 4 degree prism was incorporated in his left glass, as his parents and family physician objected to the operation proposed. In a year he had become a quiet, well poised boy of entirely different temperament, the outbreaks of temper had ceased,

2. Hansell, H. F., and Reber, Wendell: Ocular Muscles, Ed. 2, Philadelphia, P. Blakiston, Son & Co., 1912.

he no longer wet the bed at night, and he slept like a babe for eight hours every night.

The latter two case histories sound almost too good to be true, but they have convinced me of the power of an uncorrected vertical error in a child to alter their character and perhaps their whole career entirely. They also illustrate the fallacy of expecting a refractive correction alone to set aside all strain of visual apparatus in children. So insistently and dogmatically has this doctrine been laid down by our authorities and teachers, that I wish here humbly to protest against what to me seems an incomplete and unjust method — incomplete in that it does not reckon all the possible factors in a given case, and unjust to the children whose futures hinge so much on the state of their visual apparatus.

SUMMARY

Three esophorics out of eight were made comfortable on weak prisms, bases *out*, in their permanent correction.

Five other esophorics had hyperphoria and wore vertical prisms. Three of them were cured by this method, one was improved and one was not helped a bit.

Eleven exophorics out of twenty-four were made entirely comfortable on prism training alone plus the wearing of their respective corrections when needed.

Three more had prisms of from 1 to 3 degrees, bases *in*, incorporated in their regular correction, and also needed prism training to complete the cure.

Three more had permanent prisms only in their corrections, as nothing could be hoped for from their parents in the matter of cooperation.

Seven had hyperphoria, of which number, two improved so much on training of their convergence as to render lateral vertical prisms unnecessary.

The other five had sufficient vertical disturbance to compel attention and were treated from that standpoint.

Of fifteen hyperphorics, two were paretic. One was operated on successfully, and the other quite as successfully treated with vertical prisms.

Five of them became so comfortable on prism correction of the lateral error that the vertical imbalance was ignored.

Eight of them were intrinsic nonparetic hyperphorias that called for prism intervention, and all of the eight are wearing vertical prisms, six being completely cured and the remaining two in a fair way to live up to the visual requirements demanded by modern education.

No esophorics came to operation.

Two exophorics came to operation.

Two hyperphorics came to operation.

CONCLUSIONS

1. Heterophoria in children is in a certain proportion of cases an entity which must have some kind of attention.

2. Painstaking consideration of all the general physical factors is most imperative.

3. Thoroughgoing correction of the refractive status is imperative, but in some cases it is merely "first aid."

4. Esophoria when intrinsic will probably be best met with weak prisms (from 1 to 2 degrees), bases *out*, plus lateral rotation exercises.

5. Exophoria when intrinsic will often respond to training alone, frequently will need prisms, bases *in* (from 1 to 2 degrees) for permanent use, and rarely comes to operation.

6. Hyperphoria when intrinsic almost always demands vertical prisms of from one third to one half the total infinity deviation, and when paretic will more frequently than any other muscular anomaly justify operative interference.

1212 Spruce Street.

ABSTRACT OF DISCUSSION

DR. GEORGE H. PRICE, Nashville, Tenn.: Heterophoria in children is a condition we are not called on to investigate very frequently, because many people think that trouble about the eyes of children is simply a manifestation of temper or a subterfuge to avoid school work. But children do suffer from heterophorias, as is evident from the report of Dr. Reber. He called attention to an observation I, too, made sometime since, namely, infants never look at you. An infant always looks into the distance. The child in early infancy must learn to converge, just like it learns to take hold of an object. Those acts which in early life are reflex in nature, by education and training later become automatic or intentional. In the 345 cases reported by Dr. Reber, he found thirty-five cases of intrinsic heterophoria. Of this number, eight, or about 23 per cent., were esophoric; twenty-four, or nearly 70 per cent., were exophoric, and fifteen, or nearly 43 per cent., were hyperphoric. I am inclined to think that some of the esophoric cases must have been pseudo in type, depending on hypermetropia, which, when corrected, would be relieved. In the exophoric cases, if myopic, correcting the defect would in many cases give relief, but if hypermetropic, it is in all probability a pseudo type; if so, resort to exercise of the ciliary muscle is indicated, but if the exophoria is high in degree and resists the exercise, it will require an operation on the strong rectus externus to give relief. He reports quite a large number of cases of hyperphoria. This is always intrinsic, and if the degree is excessive and cannot be overcome by prisms or properly decentered lenses, then resort to operation is the only course open for relief. What was the average age?

DR. REBER: Nine to fifteen.

DR. PRICE: A little early in some, for purely conjugative functions to dominate and control, but they show conclusively that these children had not had their ciliary muscles trained up to fullest efficiency or capacity, therefore when the necessity arose to use them continuously they failed to perform their proper functions. In these cases Dr. Reber has reported only two operations. The presumption is, therefore, that he found only a small number which could not be increased in efficiency by exercises, after correction of the defects in vision, where it was necessary to decrease the tonicity or strength of the particular offending muscle, therefore he resorted to operation. I was glad he called attention to the lateral method of exercise, or wall to wall movement for the lateral muscles. This can also be applied to the superior and inferior recti muscles, by the ceiling to floor exercise. Thus we can exercise and strengthen all the recti muscles when they are reduced in tonicity. In the cases followed up it had a very beneficial effect. It is quite evident that we frequently overlook these conditions.

DR. ALBERT E. BULSON, JR., Fort Wayne, Ind.: Exceptions may be taken to the statement that heterophoria in children is a reasonably rare anomaly, for if children are tested carefully for muscle imbalance it will be found that heterophoria is rather common. I can, however, agree with the statement that in a very large percentage of cases a good refractive correction and suitable attention to the general physical condition causes a correction of the heterophoria, or at least a sufficient portion of it to give perfect relief from all symptoms referable to the eyes. In my experience it has been the children of highly neurotic temperament and those in ill health or suffering from bad hygienic regulation that have required the wearing of prisms to correct a small amount of heterophoria, but I do not believe that prisms should be

added until after the patient has worn the full correction constantly for a sufficient time to obtain the effect of it, and that in addition to this the case has been given such general attention as seems indicated.

A further point that I would emphasize is the necessity of very painstaking correction of the refractive error under atropin cycloplegia. In my own experience it has been the hyperphoria that has given most trouble in children, and I have rarely found it necessary to correct either exophoria or esophoria with prisms. My experience in the use of muscle exercises in children has not been satisfactory in view of the difficulty in obtaining sufficient cooperation on the part of the patients.

DR. G. C. SAVAGE, Nashville, Tenn.: Dr. Reber says that eyes with two degrees of esophoria in the far and two degrees of exophoria in the near are the most comfortable. This cannot be so. Orthophoria, both far and near, is beyond all question the most desirable of all ocular muscle conditions. Eyes with two degrees of esophoria for distance would see double, the false and the true objects being two degrees apart, if it were not for the demand made on the right and left fourth basal centers, compelling the external recti muscles to overcome the esophoria. This diplopia would, of course, be homonomous. The same eyes showing two degrees of exophoria in the near would have crossed diplopia, the false object being just two degrees from the true, if it were not for the activity of the right and left third basal centers compelling the interni to counteract the two degrees of exophoria. In orthophoria for distance and near no basal center would be called into action in the straight forward look. It can readily be seen that there is a difference between orthophoria and heterophoria, and that difference is very much, and always in favor of orthophoria. For cases of exophoria, and I suppose he would also include cases of esophoria, Dr. Reber advises "wall-to-wall" exercise. "Wall-to-wall and ceiling-to-floor" exercise is applicable only to cases of asthenic orthophoria. It certainly would be incapable of curing any form of heterophoria. The practice of putting at rest the ciliary muscle in the eyes of young people, for refractive purposes, is correct, for there is no other way of knowing just what work the tenth conjugate center must do in its effort to control the ciliary muscles in the interest of sharp vision. Any effort on the part of this center is associated with a corresponding effort on the part of the third conjugate center, which produces a pseudo-esophoria, the quantity of which can be known after the refraction has been determined. Even in young people the strength of the lens determined under a cycloplegic is not, necessarily, the lens to be prescribed in a given case. Those who advocate "no mydriatic" will live to a day when they will see the folly of such claim. The claim is not only unfounded, but it is one of the sweet morsels which opticians roll under their tongues. Under such delusion refraction work is at best only guess-work.

DR. WENDELL REBER, Philadelphia: As to Dr. Price's remark about exercises, I may say that prism exercises in hyperphoria have always been in my hands a lamentable failure. I have only succeeded in aggravating the symptoms. The ceiling to floor rotation exercise is of value. The idea of operation in the hyperphoria of children is mostly foreign to our office. In one of these cases I operated of my own volition; in the other I was forced to operate. The vertical prism is the one we can prescribe with the greatest assurance of comfort to the patient. I can only endorse what Dr. Bulson has said. Of course I want it distinctly understood that these cases of muscular error which I have recorded are cases in which the muscular symptoms called for attention when the refractive correction had not done its work. That is the point of the paper. Only one in ten were considered worth treating on a muscular basis; nine out of ten were made comfortable by the refractive correction alone. I believe the refractive correction should be worn at least six months before prismatic correction is attempted. As to esophoria of two degrees in the distance and exophoria of two degrees in the near, those who make careful investigation of these patients will find that they are the people who have the greatest comfort in using their eyes. As to so-called asthenopic orthophoria, if a patient has orthophoria and shows weakness of all the ocular muscles, they have not asthenopic orthophoria, they have a general myasthenia and need an allwise general medical practitioner and not an oculist.

BLOOD TRANSFUSION

WITH SPECIAL REFERENCE TO GROUP TESTS *

WALTER V. BREM, M.D.
LOS ANGELES

Since Moss[1] published in 1910 his remarkable studies of iso-agglutinins and isohemolysins, we have been working continually with these interesting bodies, and have applied the principles established by him to the practical work of transferring blood to patients suffering from various conditions. The work of Moss was so accurate and complete that during six years we have never found in it a flaw, nor have we been able to add anything essential to it. Our only addition is that we have been able to modify the technic of blood grouping so that it can be done easily and accurately within a few moment's time, and in this we have but applied Moss' principles of blood grouping to a microscopic method. Moss found that all normal and pathologic bloods alike could be classified into four groups by agglutination tests of the serums against the corpuscles. These groups are:

Group 1 (10 per cent.): Serum does not agglutinate any corpuscles. Corpuscles agglutinated by the serums of Groups 2, 3 and 4.

Group 2 (40 per cent.): Serum agglutinates corpuscles of Groups 1 and 3, not 2 or 4. Corpuscles agglutinated by serums of Groups 3 and 4, not 1 or 2.

Group 3 (7 per cent.): Serum agglutinates corpuscles of Groups 1 and 2, not 3 or 4. Corpuscles agglutinated by serums of Groups 2 and 4, not 1 or 3.

Group 4 (43 per cent.): Serum agglutinates corpuscles of Groups 1, 2 and 3, not 4. Corpuscles not agglutinated by any serums.

It may be seen that no serum agglutinates corpuscles belonging to its own group, and furthermore, that if one has a known Group 2 or Group 3 blood, he can determine the group of any other blood by testing the known serum against the unknown corpuscles, and the unknown serum against the known corpuscles. As Moss thought, we have found that the group reactions of any one person appear to be permanent characteristics, inherited, and that they probably follow the mendelian law. In 1910, my associate, Dr. A. H. Zeiler, and I found that our bloods belonged to the reciprocal Groups 2 and 3, respectively, and in tests made many times during six years, there has been no change in the group reactions. We have been able, therefore, to use either one of our bloods in determining the groups of unknown bloods.

Moss found, further, that isohemolysins, when present, always followed the group reactions of iso-agglutinins, but that while iso-agglutinins are always present with isohemolysins, the contrary is not true, and that isohemolysins are not always present with iso-agglutinins. Isohemolysins cannot be used, therefore, in determining blood groups. The isohemolysins may even interfere with the group determination, for

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* From the Clinical Laboratory of Brem, Zeiler and Hill.

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Moss, M. L.: Isoagglutinins and Isohemolysins, Bull. Johns Hopkins Hosp., 1910, xxi, 63.

strong isohemolysins may break up the agglutinated corpuscles so rapidly that they may mask the agglutination reaction. This source of error must be guarded against, especially in using the microscopic method to be described. We ourselves were led once into error by the phenomenon, and the result of the transfusion was most alarming.

The possibility of such an error arising can be obviated by using the antihemolysin which Moss found constantly present in the serum of the blood whose corpuscles are hemolyzed by a serum belonging to another group. If a little of the antihemolytic serum is mixed with the preparation of corpuscles and serum to be tested, it will prevent hemolysis, and the agglutination will proceed without interference, as serums contain no antiagglutinins.

Another precaution that must be observed is that the known Group 2 or Group 3 blood which is used for determining the group of another blood must contain in the serum strong agglutinins. The strength or quantity of agglutinins varies in different serums even of the same group, and we were led into serious error on another occasion by using a known Group 2 blood, which was weak in agglutinins, for determining the group of a donor. The known Group 2 corpuscles were not agglutinated by the donor's serum, and the known Group 2 serum apparently did not affect the donor's corpuscles, that is, the donor apparently belonged to Group 2, which was the group desired for transfusion. The reaction which resulted in this instance, also, was most alarming. Afterward we regrouped the donor's blood with another Group 2 blood and found that the known Group 2 serum agglutinated the unknown corpuscles, and that the unknown serum did not agglutinate the known Group 2 corpuscles, that is, the donor's blood belonged to Group 1 and was unsuitable for the transfusion.

In view of these facts, the technic and rationale of the method of blood grouping which we use can be easily understood.

Let *II* represent a known blood belonging to Group 2, and *x* a blood the group of which must be determined. Five or 6 drops of *II* blood are collected in a small clean dry test tube or centrifuge tube, and 1 or 2 drops, according to the size of the drops, in another tube containing 1 c.c. of 1.5 per cent. sodium citrate in 0.9 per cent. salt solution, which gives one approximately a 5 per cent. suspension of corpuscles. The percentage does not have to be exact. The *x* blood is collected in the same way in two similar tubes. The bloods in the dry tubes are allowed to coagulate, the coagulum is loosened from the side of the tube with a platinum wire, and the tubes centrifugalized to separate the serum. Serum and corpuscles are now ready for the tests. Platinum loopfuls of serum and corpuscles are placed on coverslips, which are inverted over an ordinary cell slide rimmed with petrolatum. Two loopfuls of serum are used and one of corpuscle suspension. The slides are gently rolled from side to side to agitate the corpuscles in order to bring them into contact with each other. Agglutination, if it occurs, takes place at room temperature within five minutes. It can usually be detected with the naked eye, showing as brick red particles, but should be examined, also, with the low power objective of the microscope. Rouleaux formation of red corpuscles must be differentiated from small clumps due to agglutination.

ILLUSTRATIONS OF GROUP DETERMINATIONS (THE FIGURES REFER TO LOOPFULS)

2 *II* serum + 1 *x* corpuscles = agglutination
2 *x* serum + 1 *II* corpuscles = 0

Group 2 serum agglutinates the corpuscles of Groups 1 and 3 only. But Group 3 serum agglutinates the corpuscles of Group 2, which does not happen in the foregoing test with *x* serum and *II* corpuscles. The *x* blood does not belong therefore, to Group 3, but must belong to Group 1.

2 *II* serum + 1 *x* corpuscles = agglutination
2 *x* serum + 1 *II* corpuscles = agglutination

Each serum agglutinates the other corpuscles, so the two bloods belong to the reciprocal Groups 2 and 3, that is, the *x* blood belongs to Group 3.

2 *II* serum + 1 *x* corpuscles = 0
2 *x* serum + 1 *II* corpuscles = agglutination

Group 2 serum does not agglutinate Group 2 or Group 4 corpuscles, while it does agglutinate the corpuscles of Groups 1 and 3. The *x* blood belongs, therefore, to Group 2 or Group 4. Which one is determined by testing *x* serum against *II* corpuscles, which it agglutinates. A serum does not agglutinate corpuscles belonging to its own group, so the *x* blood does not belong to Group 2, but must belong to Group 4, the serum of which does agglutinate Group 2 corpuscles.

2 *II* serum + 1 *x* corpuscles = 0
2 *x* serum + 1 *II* corpuscles = 0

The *x* blood belongs to the same group as the blood used for testing, Group 2.

COMMENT ON THE METHOD

This method of determining the group of an unknown blood requires not more than fifteen minutes after the bloods are obtained, and only small quantities of blood, such as can be obtained from a puncture of the finger tip, are necessary. The masking of agglutination by hemolysins is prevented by the serum, containing antihemolysin, that is present in the citrate-salt-corpuscle mixture. This serum, if not present in sufficient quantity to prevent hemolysis, at least delays hemolysis so that agglutination is not masked. Neither the presence of this serum, nor the citrate interferes with agglutination, and hemolysins can be disregarded.

The assertion of some authors that hemolysins can occur without agglutinins, and that, therefore, a test for hemolysins as well as agglutinins must be made, is based, without doubt, on the fact that in the tests with washed corpuscles suspended in salt solution, hemolysis can cause such a rapid breaking up of clumps of corpuscles as to mask agglutination. In order to detect agglutinins in these bloods, the preparations must be watched with care microscopically during the first few minutes after the serum and corpuscles have been mixed. I have seen complete hemolysis of corpuscles in salt solution occur in the test tube within five minutes, leaving, of course, no trace of agglutination. But marked agglutination occurred immediately in the microscopic preparations, or in preparations which contained some of the serum of the blood to which the corpuscles belonged. The quantity of the antihemolytic serum necessary to prevent hemolysis probably varies widely according to the strength of the hemolytic serum. The hemolytic action of one serum was not inhibited by the presence in the test of 2.5 per cent. of the antihemolytic serum, but 11 per cent. partially inhibited hemolysis. One loopful of antihemolytic serum added to the test mixture of two loopfuls of serum and one of washed corpuscles (making a 25 per cent. solution of the antihemolytic serum) has always inhibited hemolysis, and it is a safe plan to introduce this element into the test.

The hemolysis with hemoglobinuria which has occurred from transfusions with ungrouped bloods is explained by the dilution of the antihemolysin in the donor's serum, the dilution being great enough to leave the introduced corpuscles unprotected or but partially protected. It is probable that hemolytic serum introduced in a transfusion never causes hemolysis of the

patient's corpuscles, for in such a case the hemolytic serum is diluted, while the antihemolytic elements of the patient's serum remain relatively concentrated. The agglutinins, also, may be diluted beyond the point of danger by the patient's serum. If, therefore, it is necessary in an emergency to give a patient blood belonging to a different group, the corpuscles should not be agglutinated or hemolyzed by the patient's serum, as pointed out by Ottenberg.[2] Bloods of Group 4 answer this requirement for all the other groups, and, fortunately, Group 4 is the most common group, Moss having found that 43 per cent. of all bloods belong to it.

TRANSFUSIONS

It is not within the scope of this paper to discuss the indications for transfusion, the results and the reactions. This ground has been covered recently in a thorough manner by Ottenberg and Libman,[3] and our observations, in the main, agree with theirs. We have given 191 transfusions — 165 of defibrinated blood, nine of 1 per cent. citrated blood, eleven of 0.2 per cent. citrated blood, and six of whole blood by the syringe-needle method. Our widest experience has been with pernicious anemia — eighty-two transfusions to twenty-four patients, one of whom received twenty transfusions. Our most successful transfusions have been in cases of secondary anemia due to hemorrhage, and preceding operations. We have had reactions in about 25 per cent. of the instances. These generally consisted in the ordinary chill and fever, and were usually mild. Severe reactions occurred four times after transfusions of 1 per cent. citrated blood (Weil[4]). The temperature of one patient reached 106 F., and remained elevated for about a week. Two other patients died a few hours after, but it is fair to say that these patients were moribund at the time of transfusion. However, we feel that 1 per cent. citrated blood is toxic, is dangerous, and is unnecessary. Lewisohn's[5] method of giving 0.2 per cent. citrated blood seems safe, and this quantity of sodium citrate is sufficient to prevent clotting. Three anaphylactoid reactions occurred, two, at least, being in patients having active advanced tuberculosis. These are a study in themselves and will be discussed in a future paper.

The reactions which concern us chiefly at present are those associated with "incompatible bloods," that is, cases in which the donor's blood does not belong to the same group as the recipient's blood.

There were twelve such instances in our series. In seven instances the donor's serum was agglutinative for the recipient's corpuscles, but the recipient's serum was not agglutinative for the donor's corpuscles. There were no reactions suggestive of wrong grouping, though two of the patients had the ordinary chill and fever following. The absence of "group reactions" in the cases coincides with the view previously expressed that when agglutinative and hemolytic serum is introduced into a patient, the serum is so diluted by the patient's serum and the latter contains such an excessive quantity of antihemolysin that no "group reaction" should result. The reaction of recipients to donors in these seven instances was as follows:

Four Group 2 patients were given blood from Group 4 donors.

One Group 1 patient received three transfusions from Group 2 donors.

An eighth patient, belonging to Group 3, was given 100 c.c. of whole blood from her husband, who belonged to Group 2. The blood was transferred immediately with syringes while the patient was under an anesthetic. There was no reaction, but a "group reaction" might have been masked by the ether anesthetic. Each of these serums was agglutinative for the other corpuscles.

In the four remaining instances, the bloods bore the following relations:

Two Group 4 patients received Group 2 blood.

One Group 2 patient received Group 1 blood.

One Group 3 patient received Group 1 blood.

Three of these patients had violent reactions coming on immediately after the injection of only a small quantity, from 10 to 70 c.c., of blood. One of these had marked hemoglobinuria. The fourth patient had a mild reaction during the transfusion, which, however, was completed, 550 c.c. of blood being given. It was found later that this patient's serum was only weakly agglutinative to the corpuscles injected, and this fortunate fact probably explains why the reaction was mild. All of these patients recovered, and had no trouble with later transfusions.

An analysis of the causes of the transfusions of blood belonging to wrong groups shows that twice it was done because of emergency cases, three times because no Group 1 donor could be obtained for the patient who belonged to that rare group, and the other seven times it occurred through an error made in group testing, errors that can now be avoided. In none of the 179 instances of transfusions in which proper groups were used was there hemoglobinuria or "group reactions."

GROUP REACTIONS

These reactions are quite typical and come on quickly as a rule after the transfusion is begun, sometimes only 10 c.c. of blood being needed to precipitate the onset. There is a feeling of fulness in the head, suffusion of the face and eyes, precardial distress, dyspnea, coughing, backache, rapid and small pulse which may become imperceptible at the wrist, and sometimes complete loss of consciousness, and convulsions. Hemoglobinuria may occur. The shock is very much like the anaphylactoid shock, only, in our cases, the urticarial rash of the latter was absent. According to the views of Jobling and Petersen[6] and Bronfenbrenner[7] on tryptic shock, the conditions here are ideal for the anaphylactic phenomenon. The corpuscles introduced may be considered the antigen, and the hemolysin (which is an amboceptor-complement hemolysin) as the antibody. The union of antigen and antibody may cause the adsorption of antitrypsin, and the products of trypsin digestion of the patient's own serum may cause the shock.

CONCLUSION

The practical working out of our group tests and method of transfusions has proved most satisfactory. We have determined the groups of numerous donors and have made Wassermann tests on their bloods. Our laboratory keeps in touch with these donors, who are glad to give several hundred cubic centimeters of their blood for a small sum of money. They come to the laboratory, and, by the needle and vacuum flask method, we withdraw the quantity of blood desired having first cocainized the skin over the vein. Some

2. Ottenberg, Reuben: Studies in Isoagglutination, I, Transfusion and the Question of Intravascular Agglutination, Jour. Exper. Med., 1911, xiii, 425.

3. Ottenberg, R., and Libman, E.: Blood Transfusion; Indications; Results; General Management, Am. Jour. Med. Sc., 1915, cl, 36.

4. Weil, Richard: Sodium Citrate in the Transfusion of Blood, The Journal A. M. A., Jan. 30, 1915, p. 425.

5. Lewisohn, R.: The Citrate Method of Blood Transfusion in Children, Am. Jour. Med. Sc., 1915, cl, 886.

6. Jobling, J. W., and Petersen, W.: Mechanism of Anaphylatoxin Formation, Jour. Exper. Med., 1914, xx, 37.

7. Bronfenbrenner, J.: The Mechanism of the Abderhalden Reaction, Jour. Exper. Med., 1915, xxi, 221.

of these donors have been used many times during four years. They lose no time from work, the procedure is practically painless, they feel that the money is easily earned, and the patient is under no obligation to the donor. Having our donors classified and knowing their Wassermann tests are negative, we are in a position to give transfusions quickly. A group test of the patient's blood requires only a few minutes after the blood is obtained, and then we can summon the correct donor. The method is simple and easy for every one concerned, and the results, as far as I can judge from the literature, are as satisfactory as from other methods of transfusion. The defibrinated or citrated blood is injected intravenously through a needle without previous incision of the skin. The skin is cocainized at the time of injection.

ABSTRACT OF DISCUSSION

DR. RICHARD LEWISOHN, New York: I agree thoroughly with Dr. Brem's remarks about the toxicity of Weil's dose, in fact I was the first one to show that citrate of soda mixed with blood at the 1 per cent. ratio is extremely toxic when used in large transfusions. The general applicability of citrate of soda for blood transfusions, and the perfect safety of its use is based entirely on the small dose (0.2 per cent.). I have used the method in seventy-five cases; 20 per cent. had a rise of temperature above 101 F., and 10 per cent. had a chill. The clinical effect of the transfusions was not impaired by these reactions. I wish to sound a note of warning against the storage of the blood, or against the transfer of citrated blood from house to house. I have used this method of transfer in two transfusions and had a severe reaction in both of them. After all we know very little about biologic changes in blood which is kept in storage.

DR. GEORGE R. MINOT, Boston: At the Massachusetts General Hospital we have made use of the groups for testing donors for transfusion. Our results are quite in accord with those of Dr. Brem. I have found the use of unwashed citrated suspensions of cells of advantage in the microscopic iso-agglutination tests. I have also made use of the fact, that given serum and cells of a known Group 2 or 3, one can determine to what group an individual belongs. Dr. Moss told me that recently he found that the individual's group is often not established at birth, but that it is established in 85 per cent. of children between 1 and 2 years of age, though it may not be established completely until 10 years of age or more. Thus in testing children's blood it is perhaps better to use a direct test between donor and patient rather than the group method.

DR. F. G. NOVY, Ann Arbor, Mich.: There is one thing that needs to be emphasized in view of the statement that the poisonous effects at times following the injection of serum resemble those of anaphylactic shock. I wish to make the statement even stronger and say that normal serum is always poisonous and that the symptoms do not merely resemble but actually are those of anaphylactic shock. We used to think that serum was harmless and that it could be injected as freely as water, that is, salt solution. Such, however, is not the case since simple animal experiments show that normal serums are toxic. The effects produced depend on the dose employed, and also on the method of preparing the serum. Thus, a serum made by defibrinating with beads is considerably more toxic than one prepared by simply whipping with a glass rod. As regards the use of whole blood, it should be realized that the same danger exists, and is even greater since whole blood may become, in a short time, even more toxic than serum. Thus, to illustrate this statement, it may be said that 10 c.c. of blood drawn from a rabbit and injected intravenously into a guinea-pig, with the least possible delay, will produce little or no effect. On the other hand, if such blood is kept in the syringe for three minutes and is then injected, it will kill in a dose of 2 c.c. A typical, acute anaphylactic shock is the result. In other words, whole blood is more toxic the nearer it is to the coagulation stage. This toxicity has nothing to do with clot itself. The use of citrated serum, as pointed out, has its dangers which are more pronounced the longer it is kept. It can easily be shown that the incubation of a citrated serum results in the production of increased toxicity. That serum is something more than a harmless fluid should be recognized and not lost sight of in the future.

DR. ABRAHAM JACOBI, New York: Dr. Novy, when the serum is injected into the spinal canal is the effect as poisonous as when it is injected in the usual way?

DR. NOVY: I have had no experience in that line. My experiments have been made intravenously.

DR. WALTER V. BREM, Los Angeles: Dr. Lewisohn suggested that it might be a dangerous procedure to withdraw blood from a donor and carry it to another place for injection into the recipient; that some alteration in the blood might occur. We have done this in nearly all of our transfusions, and have not been able to attribute special reactions to it. We have transported the blood as far as seventy miles without reactions ensuing.

Dr. Novy said that serum and whole blood were deadly poison. I do not doubt that Dr. Novy can make them so by his physical methods of treating them, but these procedures do not appear to be reproduced in the technic of our transfusions; and the mild transfusion reactions that not infrequently do occur do not appear to interfere with the good results from the transfusion. It would seem, therefore, that these animal experiments of Dr. Novy do not weigh heavily against the results obtained in our method of transfusion of human beings, such transfusions having in themselves experimental value. However, Dr. Novy's work may throw light on some of the reactions and enable us to eliminate them.

I agree with Dr. Novy that the reactions I described as "group reactions" are true anaphylactic phenomena, but I felt that "anaphylactoid" would be the better word at present, for there is too great a tendency abroad to use loosely the term "anaphylaxis."

THE ETIOLOGY OF NONPARALYTIC OCULAR IMBALANCE

SOME ORIGINAL CONCEPTIONS AND INTERPRETATIONS BASED ON THE PHYSIOLOGY AND PSYCHOLOGY OF OCULAR MOVEMENTS *

WILL WALTER, M.D.
CHICAGO

In the presession volume of last year's meeting, in a paper published in the March issue of Knapp's *Archives*,[1] I laid the foundation for a new consideration of this still clouded problem by a critique on paralytic types of ocular muscle imbalance.

That was a serious effort to get a new point of attack on the problem, and this discussion is a follow-up one. It is the hope that the value of considering the question from the standpoint of levels of control will be hereinafter apparent.

In the above-mentioned critique on paralytic types and by virtue of a close study of clinical pathology, certain fundamental points were demonstrated, and evidences in the recent literature were cited in proof of levels of control of the ocular movements.[2]

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Walter, Will: Clinical Pathology of Ocular Muscle Paralysis, Arch. Ophth., xlv, 172.

2. This grouping is one which might well be regarded from the standpoint of evolution since in the lower forms where the eyes move independently (Fuse: Abducens Nucleus of Mammals, Ztschr. f. Augenh., xxix, 175) and without coordination, we find only the first level nuclei; in a second group we find evidence of combined use of eyes—some coordinated movements, and with it coincident evolution of joint control—but only in higher forms is this perfected, and only in highest forms does it carry the added attribute of convergence coordination.

These so-called levels of control are in the light of present knowlege quite accurately oriented for the high or third, and first or low levels. Evidence is only now, and as the result of pathologic findings, accumulating and is only approximate as to the mid-level; but it is not necessary to our view to know the sites of these control areas if we may exclude the high and the low levels from the consideration.

The high or third level or that of voluntary control, by virtue of which we may perform associated movements of convergence, of dextrovergence, sinistrovergence and sursumvergence in response to will, is beyond doubt in the frontal lobes. Its control centers (at the foot of the second frontal convolution) do not, however, respond to optical, acoustic or tactile impressions.[3]

This level of control does not, if my conception is correct, enter into the etiology of nonparalytic imbalance. Neither are we concerned primarily with the first or low level control of individual muscles. The nuclei for these are too well understood to require further description. We want only to emphasize the special or *individual nature of their actions.*

The ocular muscle does, then, what it is stimulated to do—contracts in proportion to its stimulus. The relay stations, wherein the amounts of stimuli are apportioned to the individual muscles, are what we term the second level control. There is a difference between *the will*—the initiating mechanism in its broadest sense (frontal cortex), and *the way* or the subconscious reflex coordinating mechanism (occipital cortex) which goes on independent of volition. If we do not accept this, even though we cannot locate the control centers accurately, we have no basis but empiricism for the use of prisms for exercise or orthoptic training of any sort, or prescribing of convex lenses to lower the impulses to convergence or concave lenses to stimulate them; or prisms for wear, or cycloplegia or any of the means we employ in the management of these cases. All of these measures operate beside volition and in a purely reflex way.

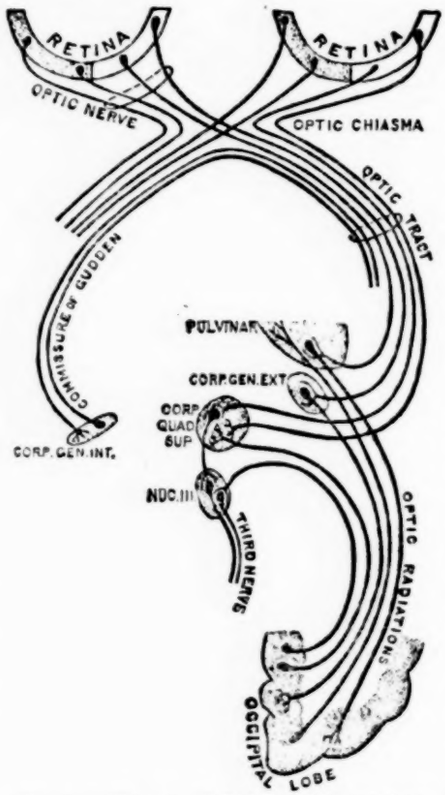

Fig. 1.—Diagram of "midlevel" connections of the optic nerve and optic tract (from Fisher).

Nor is this level of control limited to retinal impulses. With it are included impulses from tactile, olfactory, auditory and other sense stimuli.

All of these are responses to environment for the satisfaction of the fundamental things of life, as attack and defense, and satisfaction of hunger and thirst, and such stimuli are fundamental, automatic, mechanistic phenomena and are quite independent of high level—voluntary—control.

This is evident from the experimental removal of the frontal lobes or their dissociation,[4] since these reflexes remain still in action.

So, as I concluded in my paper of last year,[1] voluntary impulses (volitional control) and reflex stimuli through the vision (retinal impulses) are probably independent.

This intensely specialized reflex control[5] is a system and not an area, and is what we call in its entirety the second level of control, and this is the level concerned in the phorias and the tropias. But let us in view of the lack of definite localization of control areas of associated movements in this midlevel speak of them henceforth as coordinations. They are known to lie largely in the occipital lobes.[6] That they are not individual muscle nuclei is evident from the investigation of many observers.[7] The view that the individual muscle is ever alone in action is not supported by anatomists or physiologists or by analogy. Latterly, Suffa,[8] employing his new ophthalmotrope, proved that in no movement of the globes were there less than three muscles employed. This means that delicate coordinations—apportionment of impulses—are necessary for even the simplest ocular movements.

As Landolt[9] has recently again emphasized, the many generations of association of accommodation and convergence have tied these functions so together (phylogenetic association) that errors or weaknesses of one must show in the other function. This interassociation is the basis of all of our study, and whether appreciated or not, the literature of the phorias and the tropias is made up of efforts to search out the reflex nature of this interdependence.

Second level control is, then, that grouping of centers which is tied up with the retinal stimuli, the ciliary activity, and in general the automatic system which goes on regardless of volition or conscious effort and which is effective just in proportion to its freedom and sureness of action.

If defective at any segment, the mechanism is slower and more labored, and the individual is not up to normal in his reactions; or if he is, it must be at unusual expenditure of neuromuscular energy. In any event, he is inefficient and it is immediately apparent that

3. Freund: Paralysis of Vertical Movements, Neurol. Centralbl., xxxiii, 1215.

4. Shafer: Proc. Roy. Soc., London, 1888, xliii.

5. See Roux (Neurol. Centralbl., xxxiii, 1225) and Durand and Jaquet (Reflex Conjugate Rotation of Eyes, Limousin, med. xxxvii, 157) for tactile reflex stimuli, and for auditory, the centers for which lie in the temporal lobe, see also de Kleign (Ocular Muscles Reflex and the Ear, Nederl. Tijdschr. v. Geneesk., 1915, p. 1835; Arch. d'ophth., xxxiv, 780), Hageman (Ocular Manifestations of Aural Disturbances and Their Interpretation, Med. Rec., New York, Jan. 16, 1915) and particularly a recently reported case wherein by a quick movement of the head and hence stimulation over the auditory tract, the patient is able to overcome a paralysis of lateral movements, the eyes following the object to the extreme limits of rotation as soon as, under the influence of the auditory impulse, the motion was started.

6. Darkschewitsch: Ueber den oberen Oculomoriuskern, Anat. u. Phys. Anat. Abth., 1889. Farnariere: Diphtheritic Paralysis of Accommodation, Ann. di ottal., xlii, 572; Clin. Ophth., xix, 489. Fisher, J. Herbert: Ophthalmological Anatomy, Ophth. Rev., 1904, pp. 13, 23, 126, 130. Howell: Proc. Roy. Soc., London, 1896, American Text-Book of Physiology, 1896, p. 684. Freund (Footnote 3). Burkholder: Neurology of Fusion Faculty, Ophthalmology, x, 592. Ferrier and Turner, Aldren: Functions of the Brain, 1876.

7. Fisher: Ophth. Anat., 1904.

8. Suffa: A New Ophthalmotrope, Jour. Ophth. and Oto-Laryng., xxi, 245.

9. Landolt: Arch. d'ophth., xxxiv, 416, 466, 529.

the defect is far reaching on his response to environment.

We may *will* whether we enter into the hunt, but the eye will follow the game in a purely reflex way under stimuli from visual, auditory and other sense organs (mechanistic stimuli), and the influence of the will is limited rather to initiating and inhibiting the mechanism. In fact, it takes often so much voluntary effort to inhibit these reflex stimuli that men have been lost in the pursuit. One may will to look to the right or left or up or down, but when a sudden impulse, as through a sharp sound (auditory stimulus), a blow (tactile stimulus) or an ominous odor (olfactory stimulus), reaches the central areas, the response is a reflex, a turning of the eyes toward the stimulus; searching movements — more rapid than volition because fundamentally protective and mechanistic. These are second level acts; they are as automatic as the usual winking of the eye, and they are surer than when volitional control is called out. The reaction time as between the frontal and occipital control has been measured by Shafer,[4] who found that the former was several hundredths of a second slower than the latter. The individual who would depend on volitional control would be handicapped and would lose in the contest.

This is an important link in my conception, and I wish to drive it home: the automatic nature of this midlevel control. I regard the second level control as a part of that fundamental automatic neuromuscular mechanism by which the bodily functions are maintained, and, thus comprehended, it becomes at once a part of the great system which controls the involuntary forces, without which there would be no existence for us. There is analogy between accommodation, convergence, the act of prehension, the systole of the heart, the respiratory stimulation (an excess leading to bronchial spasm), vasomotor tone, on one side of the system, and between inhibition of accommodation and convergence and the cardiac diastole and the like on the other side. There is normally a controlling tonus in this reflex nervous system, an automatic balance between contraction and relaxation. The voluntary impulses may initiate or inhibit its actions, but only to a limited, indirect and not a controlling way.

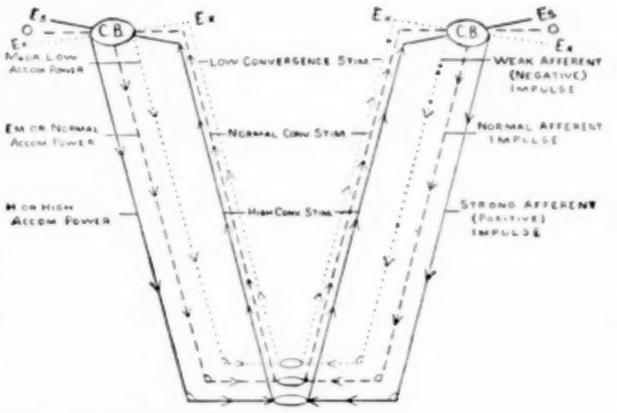

Fig. 2.—Ciliary reflex arc: *C. A.*, ciliary reflex arc; *C. B.*, ciliary body; *O.*, orthophoria; *Es.*, esophoria; *Ex.*, exophoria.

Overtonus on the part of this system shows itself in excesses of accommodation, convergence and other automatic phenomena; it shows in acceleration of pulse during forced respiration, a common condition in girls and boys under 15—the *pulsus irregularis respiratus*—and it is held by Eppinger and Hess[10] that if this phenomenon continues after puberty it is abnormal; and, be it noted here, atropin controls and pilocarpin increases the overtonus.

Now Reber,[11] in his excellent discussion on indications for operation in the tropias, thinks that it would be better if every patient who comes for operation should be at least 14 or 16 years of age, and that advancement should be preferred because of the preponderance of convergence forces before and the increase in the divergence forces after the fifteenth year.

On this I wish to lay claim to the thought that convergence power diminishes at this period, not because of the cited reasons — anatomic development of cranium and attachment of muscles to the globes — but because another element is added to the automatic nervous regulation above mentioned. From the standpoint of anatomy this so-called vegetative nervous mechanism is divided into midbrain, bulbar and sacral segments, and it is the sacral segment which becomes dominent at this age, for the evolution of the sexual function, and with it is a coincident lessening of tonus of the other segments which have in their order been dominant. The midbrain segment finds egress through the oculomotor pathways, and convergence and ciliary weakness are by no means uncommon accompaniments of puberty and adolescence by virtue of this loss in domination. This point should be considered both in diagnosis and therapy; and we may well believe it to be abnormal if, after puberty, a convergence excess holds; and we may well be forewarned not to operate for moderate degrees of convergence excess, and to undercorrect before puberty if we must operate.

This is a big, new point of view given us by this newer work on the automatic nervous system. It tells us that atropin and its like have other value than as cycloplegics since, when absorbed, they are inhibitory to the general overtonus manifested in ciliary contraction and convergence, while pilocarpin, strychnin and on occasion epinephrin are aids to the antithesis of this state, and, though they act differently, help to bring about an occasionally needed positive tone. It tells us in what manner infections, indicanuria and acidoses may quickly affect accommodation and convergence through the automatic system, and it helps to explain the frequent development of strabismus as an accompaniment of exhausting diseases.

The connection between the vegetative system and the ocular movements is through the ciliary ganglion, and we now have another reason for the administration of atropin for convergence excess, and we know why strychnin or pilocarpin is an aid in divergence excess† or convergence insufficiency, and we need not longer prescribe them empirically.[12]

There is something very fundamental in this linking of ocular movements with the automatic nervous system. It tells us to be physicians, and that phorias may be influenced by the conditions of this mechanism —

10. Eppinger and Hess: Ztschr. f. klin. Med., lxvii, No. 5, and lxviii, No. 2.

11. Reber: Indications for Operation of Strabismus, Penn. Med. Jour., xviii, 602.

12. This point of view tells us that perhaps our foreign confrères are right when they say that in our country asthenopias are exaggerated. Higher pressure of living, as exemplified by us, spells magnified tone of automatic functions; this means closer tying up of correlated acts, overwrought kinetic systems, greater central fatigue and hyperesthesia.

† Divergence excess in our legend signifies the prism divergence excess of Duane, i. e., over ten centrads.

the balance or imbalance of its segments. Overtonus of this system results also in constipation from its effects on the circular musculature of the colon and the sphincter (akin to ciliary spasm and leading to autointoxication), and in some atypical types of thyroid disease; all are related, and all are modified by atropin and intensified by pilocarpin. Undertonus leads to low accommodation, divergence excess, convergence weakness, preponderance of the sympathetic side of this automatic system, intensified by atropin, and relieved by pilocarpin. And this pharmacologic differentiation is quite characteristic of the whole involuntary nervous system.[13]

If we may, then, dismiss from our minds all thought of the primary influence of the will over the phorias and tropias, we shall have made a step toward the solution of our problem.

TWO REFLEX ARCS

I would construct two separate reflex arcs to cover our conception of the visuo-oculomotor mechanism (1) the ciliary reflex arc — the accommodative convergence loop (C. A., Fig. 2), and (2) the retinal reflex arc — the fusion loop (R. A., Fig. 3).

I hope to be able by study of these to make clear some hitherto clouded points, and to show why it is that only by way of the ciliary arc may compensatory muscular overgrowth or undergrowth be brought about. Also it may be seen why the training of the "fusion loop," as by worn prisms and prisms for exercise, is palliative only, and not in any way capable of correcting defects or weakness in the segments which go to make up the retinal arc.

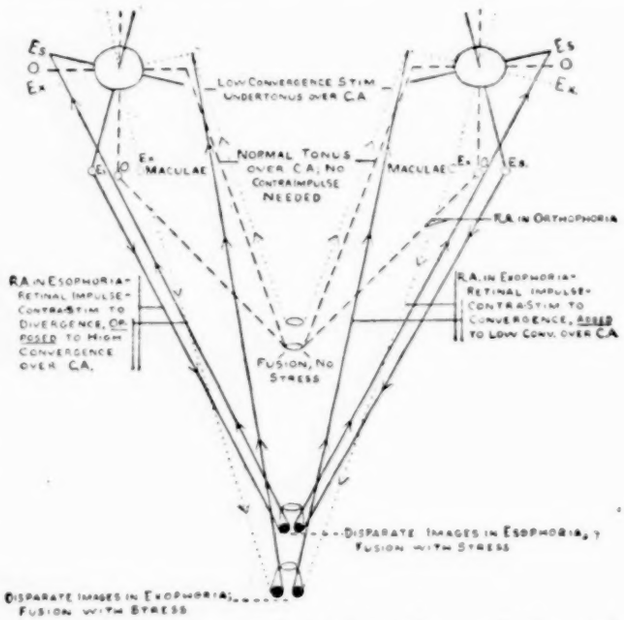
Es
O
Ex
LOW CONVERGENCE STIM. UNDERTONUS OVER C.A.
NORMAL TONUS OVER C.A.; NO CONTRAIMPULSE NEEDED
MACULAE
R.A. IN ORTHOPHORIA
R.A. IN ESOPHORIA- RETINAL IMPULSE- CONTRASTIM TO DIVERGENCE, OPPOSED TO HIGH CONVERGENCE OVER C.A.
R.A. IN EXOPHORIA- RETINAL IMPULSE- CONTRASTIM TO CONVERGENCE, ADDED TO LOW CONV. OVER C.A.
FUSION, NO STRESS
DISPARATE IMAGES IN ESOPHORIA, FUSION WITH STRESS
DISPARATE IMAGES IN EXOPHORIA, FUSION WITH STRESS

Fig. 3.—Retinal reflex arc: *C. A.*, ciliary reflex arc; *R. A.*, retinal reflex arc; *O.*, orthophoria; *Es.*, esophoria; *Ex.*, exophoria.

My conclusion that the retinal arc does not develop muscular compensation is supported by the experience of practically all of us, for prism exercise and prism wear do not bring about ocular balance.[14] On the other hand, the ciliary reflex does, and the reasons for these observations may be shown.

The significance of the various factors concerned may be briefly called to mind, craving your indulgence.

ETIOLOGY OF ESOPHORIA AND ESOTROPIA

Nonparalytic imbalance is the end-result of prolonged overstimulation or understimulation, actual or relative, and that not of an individual nerve but of a coordination. An esophoria, for example, is the result of such an overstimulation of convergence. If with it there is a correlative ciliary overgrowth, the condition is explained as a compensatory overaction of convergence; and this is true whether it has come about as the result of a hypermetropia (*a*) which forces the ciliary contraction, or whether (*b*) both accommodation and convergence are subject to overtonus as a part of the general automatic mechanism, as is common up to the age of 15. Or there may be (*c*) a weak ciliary muscle requiring overstimulation to get a focus, a stimulation which is carried over to a convergence excess, or lastly (*d*) there may be a *relatively* excessive convergence due to anomalies of development, because of which a normal ciliary contraction overacts on convergence; *a* and *b* would be differentiated by test under cycloplegia, *c* by tests of relative range of accommodation, and *d* by exclusion of *a*, *b* and *c*, supported by tropometric measurements. In *a* the compensation may be such as to cause no discomfort, or the strain of accommodation may give symptoms and require refraction, and when the correction is made, difficulties arise over the changed relations, and the problem of partial or total correction is on us. The comfort or discomfort attained depends on what I shall term the *habit impulse*, a stimulus which tends to perpetuate itself. Its breaking up is a difficult matter, and as we all know, one which tries our patience, skill and endurance to the utmost. This experience with refraction correction is one of the strong points in my conception of the ciliary reflex arc function.

INFLUENCE OF PROLONGED CILIARY ARC STIMULATION

We have seen that in early life there is overtonus of the then developed segments of the automatic nervous mechanism. The dorsal segment supplying the cardiac, respiratory, stomach and intestinal orders is dominant in infancy; then in early childhood comes the development of the midbrain segment. If perchance there is more than a low degree of hyperopia, there is an exaggerated stimulus to both the ciliary and the convergence muscles leading to increased growth. And, under normal conditions, something else happens: the muscles thicken and shorten, and the tendons widen, while the opposing muscles become thinned and elongated.

This is all going on while the tissues are plastic, and continues pari passu with the stimulation. It is a reflex compensatory development like that of the heart muscles in valvular lesions. If the ciliary stimulus is weak, so is the convergence stimulus, and there is dystrophy or undergrowth, as is shown in myopia. There is plenty of proof for this. We may vary the ciliary stimulus by increasing the strength of convex lenses, if there is overaction, or by applying concave lenses, if underaction (Fig. 4), and thus control within measure the accommodation convergence loop, and the overgrowth or undergrowth. But the results must invariably depend on the period of life, and the duration of its application. If during the plastic period of

13. Eppinger and Hess: Vagotonia Monograph, 1915.
14. Posey: Muscular Imbalance and Its Treatment, Am. Ophth., xxxiii, 24.

life, it will tend to alter the growth development, but after the tissues have their growth the changes are slower and less in effect.

Zentmayer's report[15] on the effects of correction of ametropia on the phorias are about what we would expect.[16] He says in conclusion that while the changes in the phorias were not great, even after a lapse of time, it was even less when, in a series which he studied, but two weeks lapsed before the second test. Now an early application of correction, that is, during the formative period, would have changed his results, and early stimulation of convergence in low convergence and overcorrection for high would aid or not according to how early in life it is applied. Herein is the value of prescribed plus scales in esotropias, as originally advocated by Linn Emerson[17] and later emphasized by Reber.[18] On occasion we have gone further and created artificial myopia by constant wear of overcorrection. Prolonged use of atropin cuts out ciliary stimulation entirely and leads to dystrophy. Usually the esophoria persists, and it may be that regressive changes go on faster for the ciliary muscle than for the convergence group, and that the ciliary thus drops to normal long before the convergent overgrowth; but it seems more likely that this is due to the fact that a strongly developed muscle responds to a light stimulus, and hence the stimulus which the ciliary body gets when the refraction is corrected is still sufficient to maintain the convergence at nearly its former power; and thus the esophoria is perpetuated even though the refraction is corrected.

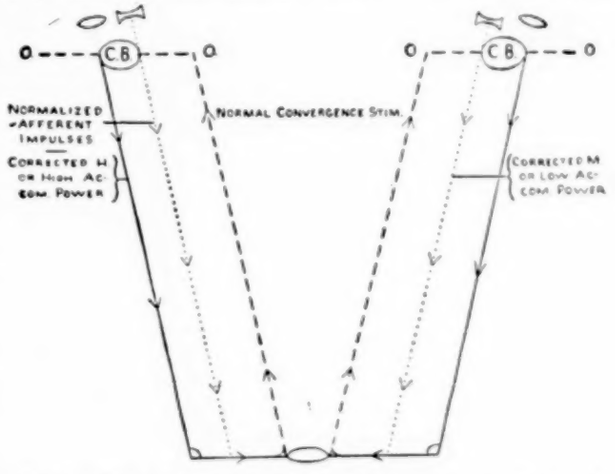

Fig. 4.—Ciliary reflex arc, showing corrections or normalization of impulses.

Hyperopia and ciliary overdevelopment, esophoria and esotropia, represent the positive side of this mechanism. The negative side of the mechanism is underdevelopment or dystrophy, exophoria or exotropia, negative or underconvergence or divergence excess.[19]

The vegetative system is not infallible and may go wrong, and hence persistent undertonus or overtonus may exist independent of errors of refraction, and such a condition, either as a disorder of automatic function or as an atavism, would explain exophorias in some cases. This may begin early in life, as convergence insufficiency from lack of tonus, and go over to divergence excess or even exotropia. This would be more likely to happen at puberty when the sacral segment develops, and would seem a reasonable hypothesis in the etiology of exophoria or exotropia. If this is so, hope is offered through the study of the stimulation of tonus in the automatic nervous mechanism.

One may see the need of correcting errors of refraction before the period of training of coordinations is passed. They are generally well established by the sixth year of life. By this means there is a chance to forestall the overgrowth or undergrowth which, once developed, tends to perpetuate itself under habit impulses.

The end-result of relative overstimulation or understimulation during the development period over the ciliary arc will be a phoria so long as the fusion loop can carry the load, and we all know from observation that its possibilities are very great.[20]

RETINAL REFLEX ARC

We come, then, to the retinal reflex arc — the fusion loop[21] — and the first point I would impress is my conception that fusion has little to do with the ciliary arc, that is, with the accommodation and convergence ratios (Fig. 5). It is the innocent bystander who so often gets the blows delivered by antagonists, and that is what happens with the much abused fusion faculty.

Fusion may depend on two factors: 1. Inheritance,[22] hereditary absence of fusion (Fig. 5), and this has been shown by many observers to be of great importance (Worth 50 per cent., Holthouse 30 per cent., Lagrange and Moreau 43 per cent., Reber 68 per cent., Junson 70 per cent.). But this is perhaps only setting the question back a little further, since we may not know whether or not the anisometropia is the inherited factor. 2. On the similarity of visual impressions (Fig. 5).

Let us now view the loop diagrammatically. It is made up of the retinal stimuli, afferent impulses, which are carried to the visual areas; and inasmuch as movements occur in the two eyes from stimulation of either occipital lobe, we know that impulses from both eyes

15. Zentmayer, William: A Study of the Effect on Heterophoria of the Correction of Ametropia, THE JOURNAL A. M. A., Aug. 15, 1914, p. 572.

16. Zentmayer finds, as the result of careful analysis and tabulation of 397 cases, that the correction of the ametropia reduces the esophoria for distance when associated with H and Ah, and tends to increase the exophoria for near. When esophoria exists both for distance and near, the heterophoria at distance will be reduced and the esophoria for near may be converted into an exophoria. Esophoria for distance, and likewise an exophoria for near will be reduced by the correction of M Am. Exophoria for distance and near will be practically unchanged by the correction of a coexisting M Am. Esophoria for distance will be little changed or may go over into an exophoria by the correction of an associated Amh. An exophoria for near, under like conditions, will be increased. Exophoria for distance in anisometropia will be decreased by the correction of the ametropia. Unfortunately age, which is the crux of the whole question, according to my conception, was not considered by Zentmayer.

17. Emerson, Linn: Convergent Strabismus, Ophthalmology, 1907.

18. Reber: Use of Bifocals in Treatment of Esotropia in Children, Ophth. Rec., xxiii, 612.

19. Bielschowsky: Position of Relative Rest of Eyes, XXXIX Ophth. Congress, Heidelberg, p. 67.

20. Bielschowsky (Footnote 19) gives evidence on this in his studies of the relative position of rest in 289 cases in which binocular vision had been lost and hence fusion was not in action. He found less than 1½° of deviation in the primary position in 25 per cent. of the cases, while 10 per cent. had 2° or more inward. Also, that in hyperopia, deviation inward (monocular esophoria) was frequent, indicating independence of the ciliary reflex arc. This also held for cases beginning before the age of puberty, whether hyperopic or not, which would seem to show the influence of the general automatic system, which we are so insistent is a factor in the action of the ciliary arc.

21. Please note that I have called this the "fusion loop" and not "fusion faculty," and this is because the latter is only the neural segment of this retinal arc, and the retinal segment is of probably paramount importance in the period of development; since if the retinal images are of varying sizes and shapes, the disconsonance renders fusion difficult or impossible (Bradburn: Etiology and Psychology of Ocular Imbalance, Ophthalmology, xi, 183). That anisometropia is a blur on fusion may be proved by self experimentation. If fusion fails, the nonfixing eye goes, of course, toward the direction of the dominant pull.

22. Howell: American Text Book of Physiology, 1896. Worth: Ibid., 1906, p. 23. Reber: Present Status of the Heterophoria Question, Ophthalmoscope, xii, 456, 592, 644.

are superposed in the visual cortex of each hemisphere[23]

Fusion of identical images takes place normally and without stress. Fusion of dissimilar images is difficult or impossible. There is not time for discussion of this intricate phase of the problem, but one may be allowed to formulate a scheme of relations between breadth of fusion and binocular single vision without subscribing to any theory.

One point should be self-evident, namely, that if the so-called fusion is sufficient to overcome an imbalance at all, it puts stress on the control coordinations. A high degree of phoria with a good breadth of fusion would cause little, while the same phoria with a limited breadth would cause much stress.

COMPENSATORY DEVELOPMENT IN THE FUSION LOOP

We have seen that in the ciliary arc there is compensation as between accommodation and convergence, and that they are coordinated. But for the mechanism of fusion such muscular compensations do not develop. If they did, prism exercise and prism wear would lead to altered rotations and diminutions of error, which we know that they do not. This is a point against the intimacy of fusion and duction.

The compensation in this loop is of a different type. Its escape is through suppression of images. If the so-called fusion is weak or absent, suppression is the easiest way out of the strain; but with strong fusion there is no escape, and fatigue and exhaustion of coordination result. This brings us to the consideration of another factor.

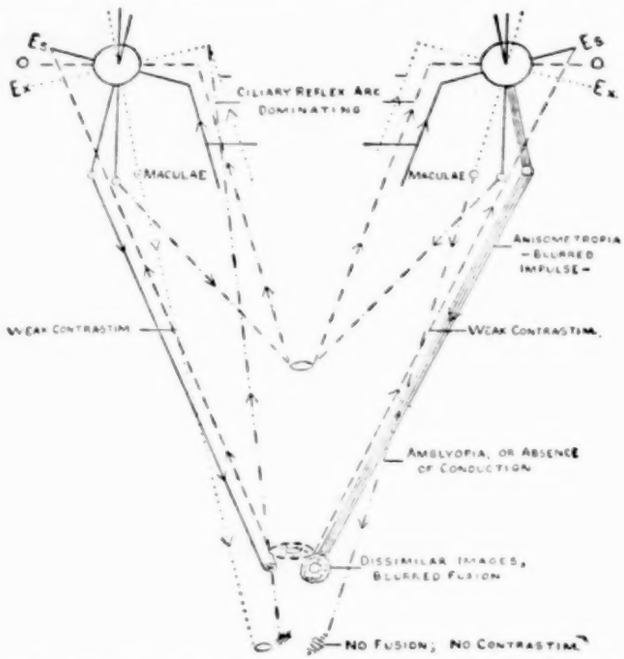

Fig. 5.—Retinal reflex arc, showing effects of anisometropia, amblyopia and absence of fusion. Abbreviations same as in Figure 3.

THE INFLUENCE OF FATIGUE

In February, 1897, I called attention[24] to the analogy between muscular asthenopia and the fatigue neuroses, and in November, 1897, continued the study by a brief[25] on the primary causation of asthenopia and the influence of fatigue. Again in 1912, at the American Academy of Ophthalmology, in a discussion of a paper by Reber[26] on prisms, this point of view was further emphasized. I can best condense this argument by quoting what was said on that occasion:

> About fifteen years ago we made an exhaustive analysis of the relation of fatigue to asthenopia, tracing the analogy between this eye distress and the fatigue neuroses, aiming to show that writer's cramp and reader's cramp are analogous. While this study did not produce such a furore in the profession as to lead to my knighthood, as the youthful mind thought its due for such a discovery, it has served as a working hypothesis since then, and is worthy your thought, clearing, as it does, many otherwise unexplainable phenomena in this complicated subject. Our case histories have during these years been recorded in terms of the neurologic nomenclature as a true dyskinesia, of spastic or the neuralgic type as the case might be, for ciliary spasm is a true spastic dyskinesia, even as is writer's or piano player's cramp. Now, reasoning from the assumed analogy, we have a right to bring to bear the observations of the neurologists in their field, where the neuromuscular organism is more exposed for electric and other tests.
>
> The work of Hodge[27] was quoted by me at that time, and the demonstration of Crile here Wednesday offers later-day confirmation that it is the central nerve elements which are changed and profoundly so, by excessive employment, and obviously the nerve stress is much greater when the conditions of muscle strain are abnormal. And as muscle may still be stimulated to contraction after complete voluntary exhaustion, we know it is the coordinating and volitional centers that suffer exhaustion and that biochemical catabolic products do the choking. I beg your attention here to the phenomena that even as the hand may be moved with freedom by sufferers from writer's cramp for other acts than writing, so the eye will move without discomfort for work other than the intricate coordinations, as reading, and this also points to the central origin of the distress.
>
> Now, attention is called to this viewpoint because it seems to explain at once why prisms worn for exercise and why minor operations on the tendons so often give relief and why that relief is so often temporary. The paradox must have often come to the notice of many of you, when prisms given have been through misunderstanding or through error wrongly applied, either for exercise or wear, i. e., as to the placing of the edge, that the patient expresses relief; also that weighted convergence exercise will often relieve the distress of esophoria, and many other seeming paradoxical experiences with prisms and with management of the ocular dynamics generally.
>
> The assumption of fatigue or exhaustion of the coordinating mechanism rather than of the muscles themselves explains the apparent paradox, and clears the subject of much obscurity, for the work of coordination is changed in detail by the altered relations brought about by the applied prisms. The relation of fatigue to incoordination, both as subjectively and as objectively manifested, is again commended to your thought.

Therefore, for something like twenty years this has been a central thought, and around it has been developed my conceptions of this mechanism.

INFLUENCE OF ANATOMIC RELATIONS

I had not intended to discuss the anatomic side of the problem, but a few points, and only a few, must be considered in support of my conceptions.

Divergence a Negative Convergence.—On the convergence or positive side of our ciliary reflex arc we have three strong muscles—the superior and

23. Howell (Footnote 6).
24. Walter, Will: On Asthenopia as a Fatigue Neurosis, Ophth. Rec., February, 1897.
25. Walter, Will: Primary Causation of Asthenopia: Relation of Fatigue, Am. Jour. Ophth, November, 1897.
26. Reber: Value of Prisms in Ophthalmic Practice, Am. Acad. Ophth. and Oto-Laryng., 1912, p. 136.
27. Hodge: Am. Jour. Ophth., xiv, 324.

inferior recti and the internus, all innervated by the same nerve, the nerve which also innervates the ciliary body. This is a dominant grouping as against the abductors, the externi and the obliques, all with different nerve supplies, and lends credence to my conception of negative convergence or reduced tonus, leading to divergence, instead of active divergence as a function. One cannot deny the existence of a control for divergence in the light of the definite clinical findings in Zentmayer's[28] case and Duane's[29] four cases of divergence paralysis. But such a center of control must be merely accessory and supporting, since it is proper to ask, What but diplopia could result from the primary employment of divergence? The power to lift one eye against its fellow — from 1 to 3 degrees of sursumduction — is another contrary movement, and what but diplopia would follow the employment of such a function? The conclusion is forced, therefore, that these, as well as two parallel movements which Maddox[30] uncovered in a case of nystagmus, and two contrary movements, namely, binocular intorsion and extorsion,[31] are control mechanisms and useful for offsetting untoward swings or torsions and not for primary acts.

Delicacy, accuracy and steadiness are needed for ocular movements, and such accessory functions are necessary to these ends. That is why also a muscle does not act alone, for there could be none of these effects with the pull of a single strand of tendon.

Regarding the Action of the Retinal Reflex Arc.—I have shown diagrammatically that stimuli from the maculae — central images — fuse naturally, but that they tend to separation in muscle imbalance. The easy and natural way — the way it would be done over the ciliary arc — to effect this in esophoria, for instance, would be by inhibiting impulses to convergence (as by plus lenses) and in exophoria by stimulating convergence (as by minus lenses), and the result of that would be a compensatory neuromuscular training tending toward balance. That such is not the method in what we call the retinal reflex arc, we know because no such muscular compensation takes place and the phoria does not change. The reverse happens, for the stimulus is thrown to the divergence coordination for esophoria and to the convergence for exophoria; and, moreover, this contra-impulse is not productive of lessened primary impulse to the convergence coordination since it is not an inhibitory one. It is a contra-impulse and leads to extra-ocular tension. There is no other active means of escape, and as this does not lead to muscular compensation, as experience tells us, the result is stress on the coordination. The only escape for this is by suppression of images, and this is impossible in well developed power of fusion. There being no compensatory muscular development over this loop, the compensation is afforded by changing the ability to fuse, and that does not alter the phoria, but only the ability to endure it. The principle taught us by this conception is, then, *Prism exercise or prism wear for symptoms*, but *refractive treatment for changing muscular compensation*. The latter must be done during the growth period for inherent defects, and on occasion for incidental imbalance.

Proof of Ciliary Arc Control of Convergence Development.—There is more convergence in high myopia than in emmetropia, but seldom does it lead to esophoria or esotropia. One would think that convergence power would increase, resulting in errors on the positive side; but such is not the case; and my conception is that the absence of the ciliary stimulus is the reason for it, since that is the afferent end of the loop through phylogenetic association.

APPLICATION

Just how do these conceptions affect us practically?

1. They speak for early setting in order of the ciliary arc — the accommodative convergence loop. This means before the sixth year; and also, if not corrected, that compensatory changes will take place and lead to conflict between the convergence development and single vision. This develops phorias if fusion is possible, or tropias if it is not.

Safeguarding the development of fusion by early creation of similar images is also necessary. This may or may not be possible, and if not the eyes should be watched for development of the dominant pull. This pull should be neutralized before overgrowth and contracture on one side have led to atrophy and thinning on the other.

Ametropes, antimetropes and anisometropes should be born with glasses on.

2. There should be recognition of the dominant effects of the automatic nervous mechanism and particularly the natural overtonus on the ciliary reflex arc, the normal plus accommodation and convergence before puberty, and lastly the influence of drugs and of the kinetic system on this tonus.

3. There should be recognition of fatigue effects and means of controlling them.

4. Has it occurred to you, as it has to me, quite out of keeping with everyday needs of ocular movements, that the eyes should be bound by such hard and fast lines as we have been led to believe? Seeing is not a mathematical problem, but a natural, and, normally, subconscious function. It is difficult to subscribe to the inelastic mechanism of the physicists. Such a conception would require that to be comfortable we must carry our heads in a fixed position, eyes horizontal, in the primary position, and all the laws of rotation, horopter, corresponding points and planes complied with. We should study the owl, who, wise in historic lore, without ocular muscles, with eyes fixed on bony bases still projects and fixes with accuracy and follows his prey, guided by neck muscles, to a degree almost incredible.

Our visuo-oculomotor mechanism is provided with many compensations, muscular and psychic, with ability to suppress confusing images, both peripheral and central, and more safeguards than we have hitherto conceived.

28. Zentmayer: Paralysis of Divergence, Tr. Am. Ophth. Soc., xiii, 521.
29. Duane: Ophthalmology, October, 1905.
30. Maddox: Case of Seesaw Nystagmus, Proc. Roy. Soc. Med., April 14, 1914.
31. Following is Maddox's table of binocular innervations, modified to my nomenclature by the substitution of versions for ductions:

KINGDOM I, FOR CREATING THE BINOCULAR EYE

Contrary	Horizontal	1. Convergence 2. Divergence
	Vertical	3. R Relative elevation over L. 4. L Relative elevation over R.
	Torsional	5. Binocular intorsion 6. Binocular extorsion

KINGDOM II, FOR DIRECTING THE BINOCULAR EYE

Parallel	Horizontal	7. Binocular dextroversion 8. Binocular levoversion
	Vertical	9. Binocular elevation 10. Binocular depression
	Torsional	11. Binocular dextrotorsion 12. Binocular levotorsion

In surprising ways the anatomic, physiologic and psychic factors are correlated, and the breadth and sites of attachments of tendon are in proportion to the needs of rotation, and to the needs of control. We would be slow if ocular movements were not reflex, accurate and from habit, easy.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

Dr. G. C. Savage, Nashville, Tenn.: Thirteen years ago I made further statement of my discovery of additional members of the family of conjugate brain-centers connected with the eyes. Up to that time only five had been known and named. Maddox had said: "Besides these five I imagine there may be three which govern torsion, and two which regulate the vertical balance of the eyes." In the same paper I announced that I had discovered another family of brain-centers, and showed that each member of this group existed in the interest of binocular single vision.

All that was said in that paper about these two families of centers was correct, but the whole truth was not stated, for the reason that some truths and beauties connected with these centers had not yet come to the surface. Later the nerve-control of the ocular muscles was more fully set forth by me. The most severe criticism was to the effect that the brain-centers discussed seem to be too numerous. Dr. Walter's paper does not deny the existence of the nine conjugate cortical centers and the twelve individual basal centers.

But two groups of brain-centers are needed for explaining the action of any ocular muscle or combination of ocular muscles, extrinsic or intrinsic. To the higher group belong the centers that are conjugate, for the reason that their cells are diaxonic; volitional, for the reason that the will, whether consciously or unconsciously exercised, is the only agent for setting free their stored neuricity; verting, for the reason that one, or at most three of them, is concerned in every turning of the eyes. These centers act alike on orthophoric, heterophoric and heterotropic eyes; on eyes that are capable of binocular single vision and on eyes that have antipathy to binocular single vision, and when there is only one eye. There are eighteen of these centers connected with the extrinsic ocular muscles, associating the twelve into nine groups of two muscles, one belonging to each eye. Only nine of the eighteen centers are ever active, eight always on one side of the brain, while the other one always stands alone on the other side of the brain. The other nine centers, eight on one side of the brain and one on the other side, neither store nor discharge neuricity, for the reason that they are not needed. Each group of nine, at birth, stands as ready as the other to take up the verting and converging work of the eyes, but the determining cause cannot be discussed here.

Dr. George H. Price, Nashville, Tenn.: The law of binocular rest and motion is imperious, and will be obeyed as long as there is equal tonicity of all the muscles, as in orthophoria, in maintaining binocular single vision. If tonicity alone is not sufficient, as in heterophoria, then tonicity plus contractility, which is brought about by the calling into action of the basal center of the weaker muscle, is necessary to compel obedience to this law. If tonicity plus contractility is not equal to the demands of this law, then there is some form of heterophoria. In discussing this question I will refer only to the phorias. Phorias are only two in kind, namely, intrinsic and pseudo. Intrinsic phorias are always muscular in origin, the varied condition one of two forms: abnormality in the relative sizes of the two muscles, or abnormality of their relative attachments. Intrinsic phorias can be cured by the exercise of the weaker muscles, or by suitable operations on the stronger or weaker muscle, and can be relieved by prisms in the positions of rest for the weaker muscle. In either of these cases the basal centers are the structures relieved. Pseudophorias are always dependent on a disordered nervous relationship between the ciliary muscles and the converging muscles, and the pseudo-error is always an esophoria or an exophoria, and never a hyperphoria, cataphoria or a cyclophoria. There are two causes for pseudo-esophoria. First, it is always dependent on a weak ciliary muscle, whether in an emmetropic or a hypermetropic eye, requiring an extraordinary impulse from the tenth conjugate center in order to produce a given amount of contraction. This excessive excitation always induces an associated impulse from the third conjugate center to the interni, causing the pseudo-esophoria. If this condition exists in emmetropia, the pseudo-error only appears in the near; but if such eyes are hypermetropic, the pseudo-error shows itself in both the far and the near. The only cure for this form of pseudo-error is the exercise of the ciliary muscle; the only other relief for such condition would be the premature prescribing of presbyopic lenses. The second cause of pseudophoria is hypermetropia, and this pseudo-error varies in proportion to the intrinsic strength of the ciliary muscles, being always less if these are strong, and always more if they are weak. This form of pseudo-esophoria shows itself in one of three ways: first, an esophoria when there is intrinsically orthophoria; second, in a greater quantity of esophoria, both far and near, than intrinsically exists; third, showing a less quantity of exophoria, both far and near, than intrinsically exists. This form of pseudo-esophoria is always and only curable by the correction of the existing hypermetropia. In the first case the correcting lenses induce a condition of orthophoria, resulting in absolute relief. In the second case the plus lenses always correct only the pseudo-error, leaving the intrinsic esophoria; hence the relief will not be complete or permanent. In such cases the plus lenses must be supplemented by exercises or operation, depending on the amount of the intrinsic esophoria in each case. In the third case a full correction of the hypermetropia should never be given, for in such a case the intrinsic exophoria would become manifest. In such a case, however, if the hypermetropia is high in degree, and urgent in its demands, here the intrinsic exophoria should be cured either by exercise or operation, depending on the amount of the intrinsic exophoria. Pseudo-exophoria, which is nothing more or less than deficient convergence, is always dependent on one of two causes, namely, a myopia, or excessively strong ciliary muscles in emmetropia, therefore always showing itself in the near. The first form is curable by correction of the myopia with proper lenses. The second form is relievable by such concave lenses as will make a supplemental demand on the tenth conjugate center, which will bring this demand up to the normal for that center in near work. Whether the pseudo-error is esophoric or exophoric, it is curable only by establishing the normal relationship between the tenth and third conjugate centers.

Dr. Wendell Reber, Philadelphia: The three levels which Dr. Walter speaks of must be considered. Sherrington and Russell showed beyond all peradventure the existence of centers in the frontal lobes. That there are others at the base of the frontal lobe seems without question. Burkholder makes a suggestive observation when he calls attention to the fact that the occipital cortex is split up by the line of Genarri in a way that no other portion of the brain cortex is arranged; we have a double arrangement of the cortex; and if there are visuo-motor centers to be used all day long, it is only to be supposed that nature would place them anatomically at about that point. This is a speculation, but is quite as good as any other. With all respect to Dr. Savage's views, until we have absolute evidence of the histologic arrangement of the third nerve nuclei, we cannot dogmatically assert the existence of various brain centers for various ocular movements. We have now five or six schemes for the arrangement of the nucleoli in the nucleus of the third nerve. We must never forget that no one ocular muscle moves an eye in any one direction. If we recall the old scheme of Mauthner (drew a diagram on the blackboard) and choose to divide it in this fashion (indicating) we will see how in the movement of one eye, two elevators must take part. If we superimpose the scheme for one eye over that for the other eye it becomes evident how movement in any direction is bound to be a very complex act. We

must bear that in mind all the time. When we come to consider the influence of the ciliary arc reflex, it does not explain the large proportion of hypermetropes that have exophoria, or divergence excess. It may be convergence insufficiency in a moderate majority as determined by poor convergence at the near point. I think convergence anomalies in the vast majority are a reversion to a lower type. Convergence is the last act of evolution that has been added to us, and the number of people with seemingly poor convergence is astonishingly large; also the great readiness with which it responds to training bears out this assumption. The idea of fatigue, as emphasized by Dr. Watler, cannot be too much emphasized. It is true as foreign authorities have claimed that we are laying too much stress on asthenopia. I believe it is simply a reflex of that high rate at which the American lives. We call it advanced civilization. Dr. Risley has happily included all this tension under the term "physiologic vices of civilization," in which we all more or less partake. I agree with Dr. Posey that in a given case of convergence insufficiency we can produce complete abatement of the symptoms with training, but that the muscular error remains at about the same amount. What the patient wants is relief from the symptoms, and this we give him with the prism training. I agree with Dr. Walter that we must be physicians first, last and all the time; that right living is the basis of cure of every muscular anomaly. I believe seeing is a mathematical problem, although Dr. Walter feels that it is not exactly so; but I believe that it is, plus the ever varying complexity that goes with the development of the association fibers in different individuals.

DR. WILL WALTER, Chicago: We are not discussing primarily the centers of control. The coordinating or reflex centers are arbitrarily placed in our scheme and are included in the mid-level control. However, answering the arguments of Dr. Savage, I see no reason for changing my views on localization of control of ocular movements. There is no fundamental difference between us as to localization, but only as to grouping of control. It certainly is better to consider the question from the standpoint of three levels of control. It is better than to divide them as he does into cortical and basal and then forthwith include the occipital cortex in the basal. We are talking of physiologic levels and not spirit levels. In the second place, it is manifestly better to adopt some such tables of movements as Maddox has given us, which is based on ocular movements that are known, then on his grouping under control of the recti and control of the obliques. This conception of independent action of recti and obliques has no proofs. The thought of convergence with the interni and divergence with the externi has been the source of more error than any fallacy on ocular movements. If we get it clearly in mind that no one muscle moves the globe in any one direction we will have less confusion, for, as we have said and many others have shown, there is no support for such a thought. It is contrary to physics and nature is not so remiss. It is certainly safer to speak of convergence control than of internal rectus control in the light of what is known of the influence of the vertical recti, for convergence is not always (perhaps not usually) done in the median plane.

The Cost of Drugs.—It is estimated that $500,000,000 are expended for drugs in this country, most of which are self-administered. Into the delicately adjusted machinery of the human body is yearly poured at least 75,000,000 pounds of drugs and chemicals, haphazard, with no real knowledge on the part of the users of what the mess is going to do to that machinery. We have cold cures, headache cures, consumption cures, cancer cures, liver pills, kidney cures, spring tonics, blood purifiers, ague cures, rheumatism cures, cures for everything except the credulity and physical neglect that make possible this enormous expenditure for drugs that are in the vast majority of cases useless when they are not harmful. Since 1880, the expenditure per capita for patent remedies consumed in the United States has risen from 33 cents to $1.54.—*Health Letter*, Life Extension Institute.

CASE OF MASTOIDITIS COMPLICATED BY PURULENT CEREBROSPINAL MENINGITIS; OPERATION AND RECOVERY*

W. H. HUNTINGTON, M.D., WASHINGTON, D. C.

History.—A. W., a white girl, aged 8, had a past history of no importance. She had complained of head colds since the latter part of December, 1915 (with occasional earache), which were not severe and subsided without treatment.

Jan. 21, 1916, the left ear began to pain intensely and the temperature was 101; headache was severe and the child was irritable. January 22, she was brought to my office by the mother, who gave me the foregoing information. At that time examination showed a slightly red membrane in the left ear; there was no bulging, and no perforation or discharge. There had never been any discharge from the ear. There was slight postauricular pain and some pain in the angle under the ear.

Treatment and Course.—A free paracentesis was done which yielded no pus; the temperature was 100.5. January 23 the mother reported that the child was feeling better and was out playing. Temperature was normal.

January 24, the mother reported that the child's temperature was 102, that headache was intense, there was frequent vomiting, and the child was very irritable, and complained of pain in the back of the neck.

I found the patient in bed, in an extremely exhausted condition. She was vomiting a greenish watery fluid, and was slightly delirious, with knees drawn up, head drawn back, pupils dilated, and marked nystagmus with quick component to the diseased side; Kernig's sign was present. There was no eruption on the body. The patient had had no chills. Tache cérébrale was negative. There was no discharge from the ear. There was slight sagging of the superior meatal wall. The temperature was 102, and the pulse, 120. The mother was informed of the grave condition of the child. My diagnosis at that time was "latent mastoiditis with meningitis," and my hopes were that the meningitis was of the serous type.

The patient was taken to the hospital, where I called Dr. McKimmie in consultation. He concurred with me in the diagnosis and advised immediate operation. Nystagmus at that time was less marked, while the sagging of the meatal wall was more marked than when the patient was examined at home. Postauricular pain was marked. The patient was delirious, with a temperature of 103, and pulse 130.

The operation revealed a large amount of fluid pus in the cortical cells, antrum, tip, and deeper cells overlying the sinus wall. There was no macroscopic evidence of necrosis of the inner table.

Paracentesis was repeated. Lumbar puncture showed fluid under marked pressure and rather cloudy. I withdrew about 25 c.c., which was taken immediately to Dr. W. H. Hough for chemical, microscopic, and bacteriologic examination. The report was as follows: Appearance, opaque; protein content, markedly increased; cells per cubic millimeter, 6,850; differential cell estimation, chiefly polymorphornuclear leukocytes; a few lymphocytes and endothelial cells; occasional macrophage and plasma cell. Fehling's solution was not reduced. The only organism present was the Friedländer bacillus.

The morning after the operation the patient was slightly delirious and irritable, and complained of pain in the head, back of neck and throat; the knees were constantly drawn up and the flexor contractions were general. There was some hyperesthesia of the back. No nystagmus was apparent. On the afternoon of the the 25th the patient was bright; the temperature was 99.8 and headache was less marked. January 26, her condition was much improved, the headache and pain in neck were much less severe and muscular contractions had diminished.

From this time, the temperature remained normal, no complications ensued and the mastoid wound healed in less than eight weeks. The patient was discharged, March 20. The

* Reported to the Medical Society of the District of Columbia, March 8, 1916.

labyrinth on the left side is functionating perfectly at this time, and there seem to be no abnormalities whatever as a result of the meningitis.

COMMENT

This case is of interest for several reasons:

Fortunately the child was seen in the early irritative stage and operated on early. I attribute the recovery to this fact and also to the fact that a lumbar puncture was done. The latter, although done principally for diagnostic purposes, undoubtedly exerted a favorable influence on the disease, and I feel certain that it was a large factor in the recovery.

Another point of interest was the fact that there never had been any discharge from the ear. This fact and the lack of other subjective and objective symptoms typical of mastoiditis would make one hesitate to make that diagnosis.

The bacteriologic work was done by Dr. Lester Neuman, and his report showing Friedländer's bacillus as the organism cultured from the spinal fluid, adds still another interesting feature, as this organism is rarely the cause of meningitis.

The intelligent observation of the child by its mother made it possible for an early diagnosis and operation. I wish to add to the plea made so often by the aurist for a close observation of children, by mothers and family physicians, when the usually neglected nasal and aural infections are in evidence. Attention to these cases will tend to the conservation not only of the special senses, but of life itself.

1624 I Street N.W.

Therapeutics

BLOOD PRESSURE

(*Continued from page 35*)

TECHNIC

It is essential that the patient on whom the examination is to be made should be at rest, either comfortably seated, or lying down. All clothing should be removed from the arm, and there should be no constriction by sleeves, either of the upper arm or the axilla. When the blood pressure is taken over the sleeve of a garment, the instrument will register from 10 to 30 mm. higher than on the bare arm.[3]

While it may be better, for insurance examinations, to take the blood pressure of the left arm in right handed persons as a truer indicator of the general condition, the difference is generally not great. The right arm of right handed persons usually registers a full 5 mm. higher systolic pressure than the left arm.

The patient, being at rest and removed as far as possible from all excitement, may be conversed with to take his mind away from the fact that his blood pressure is being taken. He also should not watch the dial, as any tensity on his part more or less raises the systolic pressure, the diastolic not being much affected by such nervous tension. The armlet having been carefully applied, it is better to inflate gradually 10 mm. higher than the point at which the pulsation ceases in the radial. The stethoscope is then firmly applied, but with not too great pressure, to the forearm just below the flexure of the elbow. The exact point at which the sound is heard in the individual patient, and the exact amount of pressure that must be applied, will be determined by the first reading, and then thus applied to the second reading. One reading is never sufficient for obtaining the correct blood pressure. The blood pressure may be read by means of the stethoscope during the gradual raising of pressure in the cuff, note being taken of the first sound that is heard (the diastolic pressure), and the point at which all sound disappears, as the pressure is increased (the systolic pressure). The former method is the one most frequently used.

By taking the systolic and diastolic pressures, the difference between the two being the pressure pulse, we learn to interpret the pressure pulse reading. While the average pressure pulse has frequently been stated as 30 mm., it is probable that 35 at least, and often 40 mm. represents more nearly the normal pressure pulse, and from 25 mm. on the one hand to 50 on the other may not be abnormal.

Faught[4] states his belief that the relation of the pressure pulse to the diastolic pressure and the systolic pressure are as 1, 2 and 3. In other words, a normal young adult with a systolic pressure of 120 should have a diastolic pressure of 80, and therefore a pulse pressure of 40. If these relationships become much abnormal, disease is developing and imperfect circulation is in evidence, with the danger of broken compensation occurring at some time in the future.

It should be remembered that the diastolic pressure represents the pressure which the left ventricle must overcome before the blood will begin to circulate, that is, before the aortic valve opens, while the pressure pulse represents the power of the left ventricle in excess of the diastolic pressure. Therefore it is easy to understand that a high diastolic pressure is of serious import to the heart; a diastolic pressure over 100 is significant of trouble, and over 110 is a menace.

FACTORS INCREASING THE BLOOD PRESSURE

With normal heart and arteries, exertion and exercise should increase the systolic pressure, and generally somewhat increase the diastolic pressure. The pressure pulse should therefore be greater. When there is circulatory defect or abnormal blood pressure, exercise may not increase the systolic pressure, and the pressure pulse may grow smaller. As a working rule it should be noted that the diastolic pressure is not as much influenced by physiologic factors or the varying conditions of normal life as is the systolic pressure.

In an irregularly acting heart the systolic pressure may vary greatly, from 10 to 20 mm. or more, and a ventricular contraction may not be of sufficient power to open the semilunar valves. Such beats will show an intermittency in the blood pressure reading as well as in the radial pulse. The succeeding heart beats after abortive beats or after a contraction of less power have increased force, and consequently give the highest blood pressure. Kilgore urges that these highest pressures should not be taken as the true systolic blood pressure, but the average of a series of these varying blood pressures. In irregularly acting hearts it is best to compress the arm at a point above which the systolic pressure is heard, then gradually reduce the pressure until the first systolic pressure is recorded, and then keep the pressure of the cuff at this point and record the number of beats of the heart which are heard during the minute. Then reduce the pressure 5 mm. and read again for a minute, and so on down the scale until the varying systolic pressures are recorded. The average of these pressures should be read as the true systolic blood pressure. During an intermittency of the pulse from a weak or intermittently acting ventricle, the diastolic pressure will reach

3. Rowan, J. J.: The Practical Application of Blood Pressure Findings, THE JOURNAL A. M. A., March 18, 1916, p. 873.

4. Faught: New York Med. Jour., Feb. 27, 1915, p. 396.

its lowest point, and in auricular fibrillation the pressure pulse from the highest systolic to the lowest diastolic may be very great.

In arteriosclerosis the systolic may be high, and the diastolic low, and hence a large pressure pulse. When the heart begins to fail in this condition, the systolic pressure drops and the pressure pulse shortens, and of course any improvement in this condition will be shown by an increase in the systolic pressure. The same is true with aortic regurgitation and a high systolic pressure.

If the systolic pressure is low and the diastolic very low, or when the heart is rapid, circulation through the coronary vessels of the heart is more or less imperfect. Any increase in arterial pressure will therefore help the coronary circulation. The compression of a tight bandage around the abdomen, or the infusion of blood or saline solutions, especially when combined with minute amounts of epinephrin, will raise the blood pressure and increase the coronary circulation and therefore the nutrition of the heart.

MacKenzie,[5] from a large number of insurance examinations in normal subjects, finds that for each increase of 5 pulse beats the pressure rises 1 mm. He also finds that the effect of height on blood pressure in adults seems to be negligible. On the other hand, it is now generally proved that persons with overweight have a systolic pressure greater than is normal for individuals of the same age. He believes that diastolic pressure may range anywhere from 60 mm. of mercury to 105, and the person still be normal. A figure much below 60 certainly shows dangerous loss of pressure, and one far below this, except in profound heart weakness, is almost pathognomonic of aortic regurgitation. While the systolic range from youth to over 60 years of age gradually increases, at the younger age anything below 105 mm. of mercury should be considered abnormally low, and although 150 mm. at anything over 40 has been considered a safe blood pressure as long as the diastolic was below 105, such pressures are certainly a subject for investigation, and if the systolic pressure is persistently above 150, insurance companies dislike to take the risk. However, it should be again urged in making insurance examinations that psychic disturbance or mental tensity very readily raises the systolic pressure. MacKenzie believes that a diastolic pressure over 100 under the age of 40 is abnormal, and anything over the 110 mark above that age is certainly abnormal.

It has been shown, notably by Barach and Marks,[6] that posture changes the blood pressure. When a normal person reclines, with the muscular system relaxed, there is an increase in the systolic pressure and a decrease in the diastolic pressure, with an increase in the pressure pulse from the figures found when the person is standing. When, after some minutes of repose, he assumes the erect posture again, the systolic pressure will diminish and the diastolic pressure increase, and the pressure pulse shortens.

Excitement can raise the blood pressure from 20 to 30 mm., and if such excitement occurs in high tension cases there is often a systolic blow in the second intercostal space at the right of the sternum. This may not be due to narrowing of the aortic orifice; it may be due to a sclerosis of the aorta. On the other hand, it may be due entirely to the hastened blood stream from the nervous excitability. This is probably the case if this sound disappears when the patient reclines. If it increases when the heart becomes slower and the patient is lying down, the cause is probably organic.

This psychic influence on blood pressure is stated by Maloney and Sorapure[7] "to be greater than that from posture, than that arising from carbonic acid gas control of the blood, than that arising from mechanical action of deep breathing upon the circulation, and than that arising from removal of spasm from the musculature."

Weysse and Lutz[8] find that the systolic pressure varies during the day in normal persons, and is increased by the taking of food, on an average of 8 mm. The diastolic pressure is not much affected by food. This increased systolic pressure is the greatest about half an hour after a meal, and then gradually declines until the next meal.

Any active, hustling man, or a man under strain, has a rise of blood pressure during that strain, especially notable with surgeons during operation, or with brokers or persons under high nervous tension. Daland[9] states that a man driving an automobile through a crowded street may have an increase of systolic pressure of 30 mm., and an increase of 15 mm. in his diastolic pressure, while the same man driving through the country where there is little traffic will increase but 10 mm. systolic and 5 mm. diastolic. Fear always increases the blood pressure. This is probably largely due to the peripheral contractions of the blood vessels and nervous chilling of the body.

(To be continued)

5. MacKenzie: Med. Rec., New York, Dec. 18, 1915.
6. Barach, J. H., and Marks, W. L.: Effect of Change of Posture — Without Active Muscular Exertion — on the Arterial and Venous Pressures, Arch. Int. Med., May, 1913, p. 485.
7. Maloney and Sorapure: New York Med. Jour., May 23, 1914, p. 1021.
8. Weysse and Lutz: Am. Jour. Physiol., May, 1915.
9. Daland: Pennsylvania Med. Jour., July, 1913.

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SATURDAY, JULY 15, 1916

THE NERVOUS SYSTEM IN RELATION TO DIET AND DISEASE

The weight of the brain, the largest component of the central nervous system, comprises less than 2 per cent. of the weight of the entire body. For this reason, perhaps, it is scarcely to be expected that ordinary chemical changes in the nervous tissues would reveal themselves readily in the midst of the preponderatingly greater metabolism which is associated with the abundant muscular and glandular structures of the body. Careful examinations of the excreta and measurements of the respiratory exchange have accordingly failed, as a rule, to give any significant indications of alterations in the brain or spinal cord which can be associated with definite functional or pathologic changes. To obtain evidence of upsets in the central nervous system it has become customary, therefore, to depend on special physiologic tests, for the opportunity to make a direct inspection of the nervous tissues and to investigate possible changes in their cells is never available except at necropsy. The nearest approach to a chemical examination of any peculiarities in the chemical changes within the nervous system consists in occasionally possible observations on the cerebrospinal fluid in which unusual products may perhaps be expected to accumulate for the moment in somewhat greater concentration than in fluids more remote from the nervous structures. Even in this case it is doubtful whether, in view of the rapid transfer of soluble substances liberated from the cells of the brain or cord into the blood stream, any detectable change of composition referable to the nervous structures themselves is to be expected during life.

There are surprisingly few data on the chemical composition of the central nervous system in relation to disease, although the pathologic histology of nervous disorders has been a fruitful field of study. In part the lack of knowledge on the chemical side doubtless is due to the inherent difficulties of such investigations. Suitable material of a sort appropriate for analysis under acceptable conditions is never abundant; and few investigators have prepared themselves for research in the biochemistry of the nervous system. The meager data available indicate that ordinary changes in diet do not materially affect the brain and spinal cord in its grosser characteristics of chemical composition. Even starvation produces slight variations, at best, from the supposed normal.

Recent years have witnessed an awakening of experimental interest in a number of diseases attended with evidences of histologic changes in the peripheral nerves and presumable alterations in the central nervous system, if one may judge from the severity of the symptoms often initiated. Such features have often been discussed in relation to beriberi and varied types of polyneuritis and more recently to pellagra. Inasmuch as these disorders are currently widely associated with deficiencies of diet, considerable significance attaches to the newly reported researches from the Hygienic Laboratory of the U. S. Public Health Service[1] relating to the chemical changes in the central nervous system as a result of restricted vegetable diet. Voegtlin has recently advanced the hypothesis that pellagra is due to a mainly vegetable diet, characterized by a relatively low percentage of protein and a correspondingly high content in carbohydrates. Koch and Voegtlin have now observed various changes in the brain and spinal cord of animals fed on an exclusive vegetable diet. The important point is that histologic examination of the central nervous system of these animals reveals extensive degeneration of many nerve tracts in the spinal cord, very similar to those found in pellagra. In some of the animals the chemical changes are practically identical with the changes observed in pellagra. These findings, therefore, are believed to yield additional evidence for the theory that pellagra is a dietary disease.

We cannot discuss here the details of the extensive chemical analyses conducted by the Hygienic Laboratory on the central nervous system in cases of uncomplicated pellagra. Koch and Voegtlin conclude that in a general way the spinal cord exhibits the most striking chemical changes, a fact which is in perfect agreement with histologic observations. The chemical changes in pellagra, while similar in many respects, differ from those in other diseases affecting the central nervous system. They believe that the present investigation brings out the fact that the central nervous system in pellagra is subjected to a series of considerable chemical changes involving principally certain lipoids. The study of these changes from a chemical point of view has led to a new method of characterization of this disease which may permit them to be correlated, as has been shown in the preceding investigation, with the changes experimentally produced in the nervous system of animals.

1. Koch, Mathilde L., and Voegtlin, Carl: I. Chemical Changes in the Central Nervous System as a Result of Restricted Vegetable Diet, II, Chemical Changes in the Central Nervous System in Pellagra, Bull. 103, Hyg. Lab., U. S. P. H. S., February, 1916. Voegtlin, Carl: Am. Jour. Physiol., 1915, Proceedings; The Treatment of Pellagra, The Journal A. M. A., Sept. 26, 1914, p. 1094.

The demonstration of an atrophy of the central nervous tissues associated with characteristic quantitative variations in the chemical constituents studied and produced by means of a change in diet is perhaps somewhat unexpected. The government investigators are enthusiastic in the belief that this is only the beginning of fruitful research in the direction of correlating errors of diet with nervous defects. In fact, they confidently expect that a number of pathologic conditions observed in nervous diseases may ultimately be explained by some as yet unknown abnormality in diet. There is nothing inherently unlikely in the possibility of correlations such as it has thus been attempted to establish.

THE EPIDEMIC OF INFANTILE PARALYSIS

All reports agree in characterizing the outbreak of poliomyelitis now making such sad havoc in New York City and elsewhere as a highly serious emergency both for the affected locality and for the entire country. The type of disease is evidently severe, and the mortality already has passed far beyond the figures reached in the great New York epidemic in 1907. The time of year is distinctly unfavorable, summer being usually the period of greatest prevalence. Once the disease has started there is generally an increase in the number of cases until checked in some unknown way by the advent of cool weather. In the Vermont epidemic of 1914 there were 8 cases recorded in July, 88 in August, 142 in September, 56 in October, and 8 in November. The increase that has occurred in New York since June 1, and especially the outbreak of the past two weeks, emphasizes the unpropitious nature of the seasonal conditions. It can hardly be anticipated that the task of combating the epidemic will be materially lighter for some weeks to come, and it may become even more formidable than at present.

Various conditions seem to threaten a more or less extensive dissemination of the disease. It is stated that many thousands of children of well-to-do parents—one estimate going as high as 50,000—were sent or taken out of New York City within the few days following the great development of the epidemic in early July. Taking into account the natural vacation exodus at this season, the danger of establishing new foci of infection can be seen to be very great.

There are several features of epidemic poliomyelitis that make the spread of this malady peculiarly difficult to combat. Certain things important epidemiologically, such as the minimum period of incubation, are not yet cleared up. The researches of Flexner and his co-workers have, to be sure, shown that the virus is present in the nasal and buccal secretions and is also eliminated in some cases from the intestines. These facts might be thought to indicate that the ordinary measures of isolation and quarantine of frank cases would be quite successful, as in some other diseases, in preventing the spread of the infection. Such measures do, undoubtedly, lessen the frequency with which infection is transferred, but unfortunately they are not so efficacious as might be anticipated, because of the apparently large number of abortive, atypical, or ambulatory cases that in one way or another escape recognition and control. Undetected cases of poliomyelitis of this sort seem to be especially numerous. As in other infections, persons who have recovered from an attack of poliomyelitis may continue to harbor the virus, and under suitable conditions disseminate it for many months. Of a different but perhaps even more dangerous type are the healthy virus carriers familiar in connection with a variety of infectious diseases. There is no precise information as to how common these healthy carriers of poliomyelitis may be, but there is some reason to believe that they are a not insignificant agency in the diffusion of infection. Potentially any one who has been in contact with either a frank case or an abortive case of infantile paralysis may become a carrier. Through this agency conceivably the specific microbe may be transferred to yet other healthy individuals until finally it reaches susceptible soil.

The important point is that a much larger proportion of cases of poliomyelitis appears to be caused by contact with an unknown virus carrier—convalescent, healthy or atypically ailing—than is the case with most other infections.

A particularly perplexing feature of this disease is the remarkable incidence in rural districts. This preference for out-of-the-way, isolated localities has been noticed in many regions in which the disease has occurred. All that is known experimentally of the localization of the virus and its mode of entrance points to direct contact with infected human beings as the chief, if not the only, means by which the disease is contracted. Insects, water supply, foodstuffs, domestic animals and other external agencies have never been proved to have any share in causing infantile paralysis. And yet some unknown feature of rural life appears to favor its propagation and spread. This rural incidence is very conspicuous in the carefully studied Vermont epidemic. "Utterly inexplicable . . . is the fact that many small sparsely settled rural townships off from main thoroughfares . . . were severely visited. Many times the first case in a town occurred in families whose members had not been away from home for several weeks and who had received no suspicious visitors."[1] In harmony with such observations are the facts that the more densely populated towns where contact is presumably more frequent often suffer less during an epidemic than the thinly settled districts near them. In the Vermont outbreak of 1914, the village of Barton, with a population of 1,300, had twenty-three cases, while Burlington, with over 20,000 inhabitants, had but thirty-two, or about one tenth as many in proportion to the population. The apparent conflict between the facts of

1. Caverly: Bull. Vermont State Board of Health, June 1, 1916.

observation and experimentation needs further elucidation. Why are there not more cases of poliomyelitis in localities where opportunities for contact are numerous than where they are few?

In spite of such puzzling questions, the best results in control have been obtained by the ordinary methods of isolation. At present the methods available for fighting the spread of infantile paralysis are those made familiar in many other infections. Every frank case and every suspected case should at once be reported to the health authorities. All cases of even slight illness in young children should be carefully handled with reference to the disinfection of discharges from the nose and mouth, and the patients, if necessary, should be placed under expert supervision. Any convalescent or any person who has been in contact with the disease must be regarded as a possible carrier of infection. Opportunities for the contact of large numbers of children, as at parties, picnics and moving picture shows, should be avoided so far as possible. Such are the methods that are suggested by our present confessedly imperfect knowledge, and measures of this character are being carried out energetically in New York. The outcome of the work of the municipal, state and national health authorities in New York will be anxiously awaited. The situation could not be in better hands. It may be confidently expected that some additional knowledge of the most effective way of combating this baffling infection will be soon forthcoming.

GIVE THE PROFESSION AND THE PUBLIC THE FACTS

When the long drawn out libel suit, in which the American Medical Association was recently involved, came to a close, and the "patent medicine" company was awarded one cent damages, THE JOURNAL received dozens of letters and telegrams congratulating the Association on the outcome of the trial. The number of condolatory letters received in this connection could be numbered on the fingers of one hand. The attitude of medical journals toward the outcome of the case will probably vary in about the same proportion as that shown in personal communications. The *Journal-Lancet* in its July 1 issue offers condolences to the American Medical Association and declares that the verdict is "a very decided victory for the 'patent medicine' association." Right there we beg to differ with the *Journal-Lancet* and reiterate that the outcome of the case was a moral victory for the Association. The *Journal-Lancet* further declares that the verdict "throws the burden of the court costs upon the American Medical Association," but here again, our lugubrious contemporary is in error. Continuing its jeremiad, that publication questions "whether it pays to attack a 'patent medicine'" or, if that be unavoidable, "is publicity the way to accomplish the true end?"

THE JOURNAL believes — and has consistently acted on that belief — that publicity is the only rational means of attacking the nostrum evil, whether of the "patent medicine" or of the "ethical proprietary" variety. Any attempt to put an end to the evils connected with the business by dealing in generalities is bound to fail. Until the public is given definite and specific facts no great strides will be made in preventing unscrupulous cupidity from preying on the sick and suffering. That THE JOURNAL'S methods of giving the widest possible publicity to the results of its investigations of fraudulent, dangerous or worthless nostrums have borne fruit is a matter of common knowledge.

One of the hardest problems the Association had to meet in defending itself in the recent suit came, not from the assaults of its avowed enemies, but from the action of those who might have been assumed to be its friends. Many times since the libel suits in question were started, the statement has been made that if the Association lost it would be due to the medical profession, and not to the "patent medicine" interests. The fact that members of the medical profession, many of them in their county and state organizations, and not a few of them actually Fellows of the Association, came to the defense of the very interests that were fighting the Association, could not help but have its effect on a jury of laymen. It is because no small part of the medical profession is itself still under the blight of the "patent medicine" business — albeit the preparations in question are euphemistically spoken of as "ethical proprietaries" — that the "patent medicine" interests were able to enlist — at a price — the help of men who were, ostensibly, so technically trained and educated as to be above such temptation.

And it is pertinent here to say that one of the most potent reasons for the continuation of this state of affairs lies with a certain type of medical journals, a class to which the *Journal-Lancet* belongs. Can it be that the *Journal-Lancet* is opposed to publicity in dealing with the "patent medicine" evil because it derives no small part of its advertising revenue from products to which THE JOURNAL has given some unwelcome publicity? Possibly it is to be expected that so long as the *Journal-Lancet* sells its own pages to such "patent medicines" as "Angier's Emulsion," "Fellows' Syrup of Hypophosphites," "Ergoapiol," "Glyco-Heroin," etc., it will deplore the methods of the American Medical Association in dealing with the nostrum evil.

The *Journal-Lancet* opines that "the American Medical Association will probably not be discouraged" by the verdict and "will probably go on in spite of a temporary defeat." It will. But the *Journal-Lancet* feels that the Association cannot go on "unless it has the full support of the medical profession and the support of the people behind the doctors." The Association has the support of the better part — numerically

and intellectually — of the profession and is rapidly gaining the support of the public. It can and will go on in its work. It would move more rapidly if all physicians and all medical journals were true to the best traditions of the profession they represent.

ECZEMA AND PROTEIN HYPERSENSITIVENESS

There has been a tendency of late to seek an explanation of certain puzzling forms of hypersensitiveness of the organism in the directions indicated by modern studies of anaphylaxis. Among the phenomena put into this category are such idiosyncrasies as occur in persons susceptible to urticaria, vomiting or angioneurotic edema after the ingestion of certain foods. Hay-fever and allied conditions have been investigated from the standpoint of an acquired hypersensitiveness to pollen protein. Attacks of asthma have been charged with an anaphylactic origin, owing to the resemblances between their manifestations and those seen in animals which have been tested after special sensitization. Fagopyrism (buckwheat poisoning) and other forms of exceptional susceptibilty to special articles of diet have furnished evidence that they may often be interpreted as conditions of hypersensitiveness to the proteins of certain foods. The outcome has been the introduction of methods of testing for a state of hypersusceptibility to various substances by application of minute quantities of suspected proteins to the scarified skin or by intracutaneous injection. A positive reaction is shown by the appearance of an urticarial wheal or of marked edema or erythema at the point of examination.

Blackfan[1] has recently called attention to the well known observation that many children, the subjects of asthma, suffer from eczema in infancy or early childhood. He states that a history of eczema in early life is nearly always the rule with patients who are unable to take different foods, such as eggs, shellfish, pork, etc., on account of urticaria and edema and sometimes asthma. It is much more than a coincidence. According to observations made at the Harriet Lane Home and Department of Pediatrics of the Johns Hopkins University, patients without eczema very rarely give a positive reaction to protein. Of forty-three patients without eczema, only one showed any evidence of susceptibility to protein by cutaneous and intracutaneous tests. Of twenty-seven patients with eczema, twenty-two gave evidence of susceptibility to proteins. Egg white, cow's milk and woman's milk were the substances that most frequently caused a reaction. If there was a reaction from one protein there usually was a reaction from several.

These coincidences may be accidental, or there may be some etiologic relationship between protein sensitization and eczema. Blackfan has attempted to apply dietary treatment or restrictions in harmony with the responses to the tests. He states that the removal of some or all of the animal proteins from the food brings about great improvement in some cases of eczema in older children and adults. With infants it is not successful, first, because it is impossible to feed an infant for a long time on a diet that contains no animal protein, without the risk of seriously affecting his nutrition, and second, because there is a strong tendency for the eczema to return, even though a protein-poor diet produces early improvement, and even though the protein-poor diet is continued. Useful observations in this field are only beginning to be collected with the accuracy that rational employment of therapy based on the results obtained really demands. It is not unlikely, however, that the new leads, fortified by further statistics furnished by numerous rigorously controlled cutaneous tests, will open a way to real progress in the management of certain rather intractable conditions which have heretofore been treated in a decidedly empiric way.

1. Blackfan, K. D.: Cutaneous Reaction from Proteins in Eczema, Am. Jour. Dis. Child., June, 1916, p. 441.

Current Comment

UNEQUAL DISTRIBUTION OF MONEY FOR MEDICAL EDUCATION

Prior to fifteen or sixteen years ago, gifts for medical education were few and far between; in fact, were scarcely heard of. Since that time, however, donations to medical schools have been gradually increasing both in size and in frequency. Since then, citizens of various localities have shown their increasing interest in medical education by responding more readily and generously to requests for financial assistance by local medical colleges; state legislatures are making larger appropriations for state medical schools, and individuals making donations to medical schools during the last fifteen years not only have increased in number but also are giving larger sums. Such gifts have increased from a few thousand dollars in each instance to hundreds of thousands, and, in the last three or four years, gifts of millions have been frequent. Thus far, however, donations have been made under the stress of the moment to individual colleges and not in accordance with any national plan for the financing of medical education. As a consequence, some medical schools have received large sums, while others, perhaps equally deserving, still lack funds necessary to provide even the barest essentials for medical teaching. This is particularly true in some of the smaller or thinly populated states which cannot provide large sums for medical education. It is also true in other states where private universities, without state aid, are performing the function of state universities. Some of these institutions particularly need and deserve generous financial aid. They have secured better teachers, improved their laboratories, and increased their equipment to a commendable degree. Some have adopted higher entrance requirements, knowing that such action

would reduce their enrolment of students and, correspondingly, their financial income. There should be some method whereby these deserving schools might share in the generosity of those having money to give for medical education. This thought is worthy of consideration by organizations which have been given the privilege of distributing large funds for education, such as the Carnegie Foundation for the Advancement of Teaching, the General Education Board and the Rockefeller Foundation.

THE PITUITARY BODY AND RENAL FUNCTION

In three cases of diabetes insipidus studied by Motzfeld,[1] the subcutaneous injection of pituitary extract was followed by a marked decrease in the quantity of urine passed and an increase in its concentration. This effect, which was not permanent, could be maintained by giving from two to five injections in twenty-four hours. The anterior lobe, however, was found to have no effect in controlling the diuresis. He would conclude that diabetes insipidus is due to a lowered functional activity on the part of the posterior lobe of the pituitary body, and not to malfunction of the anterior lobe. This conclusion is in accord with the results of the experiments, and also with the fact that, in a number of cases of diabetes insipidus, definite lesions in the posterior lobe of the hypophysis, as secondary tumors, have been demonstrated. He also observed the effect of pituitary extract in diseases other than diabetes insipidus, finding in twenty-one cases that the quantity of urine passed was diminished for periods varying from two to four hours, in one instance for a much longer period. Epinephrin given simultaneously with pituitary extract was not antagonistic to the action of pituitary extract. From these observations it is evident that the pituitary body exerts a constant physiologic influence on renal function.

THE IDENTITY OF THE TRYPANOSOMES

Central Africa is a country abounding in wild game, whose protection from extermination has been one of the principal solicitudes of the governments of that region. Nor has that attitude been dictated by scientific or humanitarian considerations. On the contrary, the wild game of Africa is of the utmost economic importance to its peoples. When, therefore, we find a scientific commission recommending the destruction of all wild game over the whole of the tsetse fly area, which is considerably larger than the United States, one would naturally expect to find the grounds for such recommendation absolutely sound. Such a recommendation was made by the sleeping sickness commission of the Royal Society; it is based on the alleged identity of *Trypanosoma brucei*, which infests game, with the trypanosomes causing disease in man in Nyasaland. However, investigation of the grounds for this identification shows that they are hardly sufficient to justify so drastic a measure as the wholesale destruction of the wild game of central and eastern Africa. The decision of the commission has been seriously attacked by Maynard,[1] statistician and clinician to the South African Institute for Medical Research. Maynard traverses all the grounds for this supposed identification of these trypanosomes, and shows that, on the whole, even the evidence adduced by the commission goes toward establishing the non-identity of the organisms in question. The greater part of the pamphlet is taken up with an elaborate mathematical analysis of the curves plotted from the morphologic characteristics of the different organisms. The commission had relied on mere inspection of these curves in judging of their identity. Maynard and Pearson have shown that on proper analysis the seeming similarity of the different curves disappears, and it becomes highly probable that in several instances the strains examined by the commission were impure.

SYNTHETIC SUBSTITUTES UNDER THE HARRISON LAW

The Harrison Narcotic Law, as is now well known, restricts the manufacture, sale or dispensing of "opium or coca leaves or any compound, manufacture, salt, derivative or preparation thereof" to persons registered under the act. The language quoted is from Section I of the law. In all other sections, with a single exception, the drugs covered by the law are referred to as "the aforesaid drugs." In Section VI, however, after providing for the exemption of preparations containing minimum quantities of these drugs, the law exempts from the exemption "liniments, ointments and other preparations which contain cocaine or any of its salts or alpha or beta eucaine or any of its salts or any synthetic substitute for them." On the legal theory that a section of a law could be interpreted by a succeeding section, if the succeeding section were more explicit and illuminating in its verbiage, the Treasury Department issued Treasury Decision 2194, placing "alpha and beta eucaine or any of their salts or any synthetic substitute for them" under the provisions of the law. To this ruling, the Farbwerke-Hoechst Company, the manufacturers of novocain, a synthetic substitute for cocain, took exception and, by agreement, a test case was argued before the United States District Court of New York. It is reported that the court took the case from the jury and ordered a verdict for the Farbwerke-Hoechst Company, on the ground that the text of the law did not include synthetic substitutes except in Section IV, where it was without force as far as the general construction of the law is concerned. This ruling is an important one, and it is probable that the case will be taken to the higher courts.

1. Motzfeld: The Pituitary Body and Renal Function, Boston Med. and Surg. Jour., 1916, clxxiv, 644.

1. Maynard: The Trypanosomes of Sleeping Sickness, 1915.

Infant Mortality and Ignorance.—In those countries where the marriage document is signed with X, instead of a signature, there is the highest infant mortality. In these countries there is a large proportion of women who have never been educated, and who are consequently ignorant not only about general matters, but also about matters concerning the proper care of their infants.—Ashby, Infant Mortality.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Full Time Health Officer.—It has been decided that Talladega will have a full time health officer, to be selected by the Talladega County Medical Association, with a salary of $3,000.

Mastin Jubilee.—The faculty and students of Spring Hill College, Mobile, paid tribute to Dr. William M. Mastin, Mobile, on the occasion of the silver jubilee of Dr. Mastin's connection with the college as health guardian of the faculty and students.

Personal.—Dr. Cecil D. Gaston has been appointed city health officer of Birmingham, succeeding Dr. Russell M. Cunningham, resigned.——Dr. Burdett L. Arms, Galveston, Texas, has succeeded Dr. Philip B. Moss as director of the State Laboratory and Pasteur Institute, Montgomery. The position has been temporarily filled by Passed Asst. Surg. Joseph R. Ridlon, U. S. P. H. S., pending the appointment of a successor to Dr. Moss.—Dr. Thomas F. Dryer, Huntsville, has been elected whole time health officer of Huntsville and Madison County.

Hospital News.—The section of St. Margaret's Hospital which has been used for negro patients will be much improved and will be converted into a section for the treatment of white patients, and an additional two story building, for the care of negro patients, is being erected at a cost of $25,000.——Work is about to begin on a four story hospital at Gadsden to be known as the Gadsden Infirmary. The building is to be erected by Dr. James E. Leach, Gadsden, and will cost $30,000.——The new hospital for negroes at Huntsville has been opened for the reception of patients.——Two hospitals are being built in Dothan at a cost of about $25,000 each. One is being erected by Dr. Mercer S. Davie and the other by Dr. Earle F. Moody, both of Dothan.

DISTRICT OF COLUMBIA

Appointment to School Board.—The term of Dr. Creed W. Childs as member of the Board of Education of the District of Columbia having expired on the 30th of June, the Supreme Court of the District of Columbia, the appointing body, announced the appointment of Dr. J. Hayden Johnson (colored) to succeed Dr. Childs. The term of service is three years. Dr. Johnson was formerly president and is now chairman of the committee on public health of the medical society. He is also state vice president of the National Medical Society.

Physicians Ordered to Texas.—A large number of officers of the Medical Corps and of the Medical Reserve Corps have been ordered to proceed at once to Fort Sam Houston, Tex., and other points along the Mexican border for duty. In the list are First Lieuts. Clarence S. Ketcham, Charles W. Riley, Robert P. Williams, Roy K. Evans, Percy J. Carroll, Charles H. Hecker, John P. Beeson, Paul E. Bowers, Arthur W. C. Bergfeld, Bacil A. Warren, Clarence Gunter, John H. Beckert, J. G. Ellis, Jr., Thomas C. Savage, Ernest C. Dalton, Fred T. Koyle, Isaac W. Brewer, Lester L. Roos, Louis D. Mead, and Frank E. Winter.

Memorial Planned to Maj. Walter Reed.—A fitting memorial to Maj. Walter Reed of the army, the discoverer of the yellow fever mosquito and for years a resident of Washington, D. C., is planned for the campus of the University of Virginia, of which he was a graduate, according to an appeal sent out in the current alumni journal of that institution. Each nation, it is said, which has been directly benefited by Major Reed's work, would be glad to contribute a block of stone, from which the memorial would be built. Each block of stone could be carved with the name of the contributing nation. A number of suggestions as to the form the memorial should take have been advanced.

GEORGIA

Higher Entrance Standard.—A letter just received from the Atlanta Medical College states that, commencing Jan. 1, 1913, two years of college work will be required for admission to that institution.

Increased Entrance Requirement.—An official communication from the University of Georgia, Medical Department, states that two years of college work will be the entrance standard of that institution on and after Jan. 1, 1918.

Personal.—Dr. Lee Smith, Dublin, has been appointed a member of the staff of the Medical Department of the Southern Pacific Railway Company with headquarters at the Southern Pacific Hospital, San Francisco.——Dr. James J. Martin, Atlanta, has been appointed superintendent of the City Contagious Disease Hospital, Atlanta, succeeding Dr. Cornelius E. Ware, term expired.

ILLINOIS

Infantile Paralysis.—New cases of infantile paralysis have been reported in Christopher, Gibson City, Streator, Kankakee and near Oregon. It is said that there have been several cases of the disease recently at Decatur.

Personal.—Dr. Edward A. Morris, Springfield, has been commissioned first lieutenant, M. C., Ill. N. G., and assigned to duty with the Fourth Infantry.——Dr. Robert R. Smith, Mount Vernon, has been appointed superintendent of the Alton State Hospital.

Public Health and Welfare Association Organized.—At a meeting of the representatives of medical, health and social organizations and municipal health officers, held in Urbana, June 26, the organization of the Illinois Public Health and Welfare Association was perfected and Dr. John A. Robison, Chicago, was elected president.

Chicago

Return from War Zone.—Dr. George G. Davis has returned after a considerable period spent in English war hospitals, where he achieved the rank of lieutenant-colonel in the British army.——Dr. William Arthur Clark, director of the American Red Cross unit at LaPanne, Belgium, for several months, has returned to Chicago.

Personal.—Dr. Arthur Dean Bevan was given the honorary degree of Master of Arts by Yale University, June 21.——At the fifty-eighth annual commencement of Northwestern University, the honorary degree of Master of Science was conferred on Dr. Edmund J. Doering.——Dr. Ethan A. Gray has been appointed a member of the committee on business management of the Chicago Municipal Tuberculosis Sanatorium.

Infantile Paralysis.—An appropriation of $5,000 has been made to aid in the prevention of infantile paralysis. This fund will be used for the salaries of field physicians who are meeting incoming trains from New York and examining all children on board. There is believed to be little danger of an epidemic in Chicago, but all precautions are being taken.——The death believed to have been from infantile paralysis is reported by the health department to have been due to another cause.

Institute of Medicine Secures Home.—Mrs. F. S. Coolidge has donated to the Institute of Medicine of Chicago the house 2636 Prairie Avenue, in memory of her husband, Dr. F. S. Coolidge. This gift gives to the institute a permanent home which will enable it to begin the formation in Chicago of a strong medical institution, analogous to the College of Physicians in Philadelphia, the Academy of Medicine in New York, and other similar institutions. Physicians, medical teachers and investigators who have common professional and scientific interests and ideals will meet here, and thereby the progress of medicine in this center will be advanced. It is further anticipated that this house will not only be used for scientific meetings, but will also offer facilities for the adequate preservation of books and other objects of medical, historical and scientific interest.

Base Hospital Personnel.—The personnel of the Chicago Base Hospital Unit No. 1 was announced, July 10. It will be under the direction of Dr. Frederic A. Besley. The surgical division will consist of Drs. Joseph F. Jaros, Thomas J. O'Malley, V. David Greer, Oak Park, Payson L. Nusbaum, Walter L. Stranberg, Joseph J. Lebowitz, Hammond, Ind., A. M. Krost, Hyrum Y. Richards, and Burt H. Hardinger Gays. The medical division will consist of Drs. Milton Mandel, assistant director; Martin R. Chase, Leo G. Dwan, Hugo W. Traub, David E. Markson, Frank Whitmore and William P. Honan. The personnel of the laboratory division is as follows: Drs. Alexander A. Day, assistant director; James P. Simonds, pathologist; M. L. Blumenthal, P.Ph., roentgenologist, and George E. Meyer, D.D.S., and Charles W. Freeman, D.D.S., are the oral surgeons of the unit.

KENTUCKY

Tuberculosis Work.—A meeting of the State Tuberculosis Commission was held in Louisville, June 30, to close accounts for the fiscal year. The commission adjourned to meet July 6.——May 31, Dr. Dunning S. Wilson, Louisville, was appointed a member of the Kentucky Tuberculosis Commission, to succeed Dr. Everett Morris, LaGrange, term expired.

Personal.—Dr. Hubbard T. Buckner, Covington, is now assistant surgeon at the American Ambulance, Neuilly, near Paris.——Dr. J. H. Ammonds has been appointed a member of the state extension board.——Dr. Isaac H. Browne, Winchester, has been elected vice president of the Clark County Health and Welfare League; Dr. Harvey R. Henry, chairman of the committee on care and suppression of tuberculosis; Dr. George F. Doyle, committee on inspection of schools, and Dr. Isaac A. Shirley, committee on malnutrition and maintenance of medical clinic for the poor.——Dr. Lillian H. South, Bowling Green, state bacteriologist of Kentucky, delivered an address before the Butler County (Ohio) Medical Society at Hamilton on "Hookworm Disease and Pellagra."

LOUISIANA

Chiropractic Bill Defeated.—The bill asking for a state board of chiropractic, recently submitted to the Louisiana legislature, has been reported unfavorably by unanimous vote of the Committee on Health and Quarantine, to which it had been referred. This vote was taken after the committee had heard a chiropractor claim that goiter, tuberculosis, diphtheria, pneumonia and like diseases could be easily cured by the chiropractic method of manipulation of the spinal column.

Lack of Funds Imperils State Board.—The action of the appropriations committee of the house in cutting out the annual appropriation of $50,000 for the state health department leaves the board facing a practical abolition of the department. The board appointed Drs. Theophilus T. Tarlton, Grand Coteau, and William M. Perkins, New Orleans, to go before the Senate Appropriations Committee and ask that this important matter be considered. The operating fund of the board has, it is said, been exhausted and while there is remaining $20,000, this sum has been appropriated for the establishment of a state tuberculosis sanatorium.

Hospital News.—The cornerstone of the Corinne Casanas building of the Presbyterian Hospital, New Orleans, was recently laid with appropriate ceremonies. The building is to be used as a free clinic for the poor and, when completed and furnished, will represent an expenditure of $40,000, the amount of the bequest left by Miss Casanas. The building will be fireproof, and will face Girod Street adjoining the main building. The lower floor will be used as a clinic and the upper floor for the dormitory for nurses.——The annual report of the New Orleans Eye, Ear, Nose and Throat Hospital was devoted in a great measure to a report of the fight against diphtheria which the hospital has been waging for several years. During the last year 4,759,000 units of diphtheria antitoxin were dispensed, and the mortality of diphtheria has been reduced to about 1.5 per cent. During the year 7,698 cases were treated, 47,943 consultations were given, and 2,158 of the patients came from other parishes.

MAINE

Personal.—Dr. Thomas Tetreau has been appointed health officer of Portland.——Dr. John A. Donovan, Lewiston, for fifteen years surgeon in chief of the Central Maine General Hospital, celebrated the fiftieth anniversary of his entrance into the practice of medicine, April 30.——Dr. James P. Russell, South Brewer, has been elected president, and Dr. Calvin P. Thomas, Brewer, a director of the Bangor Antituberculosis Society.

MARYLAND

Infantile Paralysis in Baltimore.—The first case of infantile paralysis in Baltimore occurred on July 7 and the patient was immediately quarantined. Two cases have occurred during the past week in Anne Arundel County, one of the patients dying later at the University Hospital. The health officers are using every precaution to prevent an epidemic.

Personal.—Drs. Nathan Winslow, Edgar B. Friedenwald and Duncan MacCalman, all of Baltimore, have been ordered to Fort Sam Houston, Texas, for duty with the Medical Reserve Corps.——Dr. Robert W. Johnson, who is first lieutenant, Medical Corps, assigned Fourth Maryland Regiment, has left for Eagle Pass with his regiment.——Dr. D. Tanquam of Java has arrived in Baltimore to undergo radium treatment at Dr. Howard A. Kelly's Sanatorium.——Dr. Harry Friedenwald, Baltimore, was elected president of the Federation of American Zionists at its annual session in Philadelphia, July 5.

Rockefeller Foundation Explains Purposes of Hygiene Institute.—An official bulletin just issued by the Rockefeller Foundation is the first public statement of the principles and purposes of the School of Hygiene and Public Health to be established as an integral part of Johns Hopkins University. The school will be opened in October, 1917, as it is estimated that a year will be required for the construction and equipment of the institute and the gathering together of the staff of teachers. The school is established in recognition of the urgent need in this country of improved opportunities for training in preventive medicine and public health work, as the facilities for those desiring to devote themselves to preventive medicine and the promotion of public health are as yet inadequate.

MASSACHUSETTS

Floating Hospital Begins Work.—The Boston Floating Hospital made its initial trip for the season, June 28. The ship sailed at 9 o'clock, returning to its dock at 4:30 in the afternoon. G. Loring Briggs is manager of the institution, and is assisted by a staff of physicians and seventy nurses.

Psychopathic Conference.—The fourth annual conference on the medical and social work of the Boston Psychopathic Hospital was held, June 10, under the auspices of the Boston State Hospital. The entire institution was open to public inspection, and at the conference Mr. Henry Lefavour, chairman of the board of trustees, presided. Addresses were made by Dr. Elmer E. Southard of Harvard Medical School; Dr. Herman M. Adler, chief of the staff of the hospital; Dr. Elisha H. Cohoon, administrator of the institution; Dr. Harry C. Solomon, special investigator for the State Board of Insanity; Mr. R. M. Yerkes, psychologist for the hospital, and Dr. Thomas W. Salmon, New York, medical director of the National Committee for Mental Hygiene.

Personal.—Dr. Frank S. Atwood, Salem, has been renominated as medical examiner of Essex County.——Dr. Frank J. Wheatley, North Abington, has been appointed, by the governor, chairmain of a commission to investigate the use of habit-forming drugs.——Prof. Selskar M. Gunn, director of the division of hygiene of the state department of health, resigned, June 23, to take effect August 31. Dr. Lyman A. Jones, Swampscott, will succeed Professor Gunn.——Dr. J. Erle Forrest, Franklin, who has been in the employ of the Serbian government for several months, has returned after an interesting trip through Bulgaria, Roumania, Russia, Scandinavia and England.——Drs. Elliott P. Joslin, Francis M. Rackemann, William W. Howell and Charles D. Easton, Newport, have been elected councilors of the Harvard Medical Alumni Association.

MICHIGAN

Personal.—Dr. Charles A. Lenhard, Detroit, has been reappointed surgeon-general of the International Order of Knights of St. John.——Dr. D. Emmett Welsh has been appointed a member of the Grand Rapids Board of Health.——Dr. William A. Wilson, Detroit, has been appointed field superintendent of the Michigan Child Welfare Congress.——W. S. Kellogg, Lapeer, has been appointed assistant secretary of the state board of health.——Dr. Victor C. Vaughan, Ann Arbor, delivered the principal address before the Montana Health Officers' Association at Miles City, July 10.

Tuberculosis Survey of Houghton County.—The state health experts in charge of the health survey in Houghton County held free examinations in Houghton, June 27 and 28, in the court house; in Hancock, June 29 and 30, in Germania Hall; in Calumet, July 5 and 6, in the city hall; in Lauriun, July 6 and 7, in the city hall, and one day clinics in Mohawk, July 3, at St. George's Hall, and at Lake Linden, June 27, at McKinley School.——A special meeting of the Houghton County Medical Society was held at Houghton at the Red Jacket town hall, June 28, at which Dr. Edwin R. Van der Slice, Mason, spoke on "The Early Diagnosis of Pulmonary Tuberculosis," and Dr. William DeKleine, Lansing, director of the tuberculosis survey, spoke on "The Scope of the Tuberculosis Survey."——A tuberculosis survey will start in Sault Ste. Marie, September 25.

MINNESOTA

Southern Minnesota Physicians to Meet.—The midsummer meeting of the Southern Minnesota Medical Association will be held at Rochester, August 1 and 2, under the presidency of Dr. E. Starr Judd, Rochester. The program includes, in addition to the papers to be presented, surgical clinics at St. Mary's Hospital and the Mayo Clinic building, and demonstrations in the laboratories of the latter.

Extermination of Mosquitoes.—Prof. C. W. Howard of the state farm is in charge of sixteen University of Minnesota students who, under his direction, are endeavoring to exterminate mosquitoes in a section of Minneapolis covering 8 square miles. The work includes the covering, screening and destroying of tin cans, rain barrels and other water containers and the oiling of stagnant pools and swamps.

Personal.—Dr. Charles H. Mayo, Rochester, was the guest of honor at a banquet, June 22, given by the citizens of Rochester in recognition of Dr. Mayo's election as president of the American Medical Association. A silver loving cup was presented to Dr. Mayo.——Dr. Mayo was also the guest of honor of the Knox County Medical Society at Mount Vernon, Ohio, June 19, and on the same day he was given an honorary degree by Kenyon College.——Dr. Oliver S. Olson, for four years surgeon in charge of the infirmary of the Duluth Steel Plant, has resigned and will devote himself to private practice.——Dr. Gilbert J. Thomas, for seven years a member of the Mayo staff at Rochester, has moved to Minneapolis.——Dr. Orville C. Trace, Little Falls, is reported to be seriously ill as the result of a cerebral hemorrhage.

MISSISSIPPI

Health Survey of Columbus.—Surg. Rudolph H. von Ezdorf, U. S. P. H. S., and Sanitary Engineer J. A. A. LePrince have recently completed a health survey of Columbus. They submitted to the mayor and city council a report of their work, together with a map showing infected places and breeding points and recommendations regarding the betterment of conditions as regards malaria.

Tuberculosis News.—Dr. Walter H. Rowan, formerly state sanitary inspector, has been elected superintendent of the Mississippi Tuberculosis Sanatorium, which is to be established under authority of the last legislature. The legislature appropriated $25,000 for building the institution, and a cash donation of a similar amount and a site of 270 acres has been made by a citizen of Hattiesburg.——The Lauderdale County Tuberculosis Hospital has been transferred to the Earnest Workers Circle of King's Daughters, Meridian.

MISSOURI

Personal.—Dr. Ralph McReynolds, Knox City, has returned after several months' Red Cross service in Belgium.——Dr. John L. Cox has been appointed police surgeon of St. Joseph, succeeding Dr. Frank G. Beard, city physician and police surgeon, who has been appointed health officer of the city.——Dr. George L. McCutchan, physician at the State Penitentiary, Jefferson City, has resigned and has been succeeded by Dr. William A. Clark, Jefferson City.——Dr. Thomas F. Miller, head physician in the Kansas City General Hospital, has been appointed assistant superintendent of the institution.——Dr. Oscar L. Peak, Springfield, was elected national medical director of the Knights and Ladies of Security at the annual meeting of the national council of that order in Toledo, June 16.

St. Louis

Free Attendance on Soldiers' Families.—Members of the St. Louis Medical Society and the staffs of eight hospitals have agreed to render medical and hospital service without compensation to the families of militiamen who have gone to the front. A temporary relief committee of the society has opened an office at Room 316, Security Building, Broadway and Olive streets.

NEW YORK

State to Fight Poliomyelitis Epidemic.—Dr. Hermann M. Biggs, state commissioner of health, has instructed the health officer of Orange, Rockland, Putnam, Westchester, Nassau and Suffolk counties to report by telegraph every suspected case of infantile paralysis and to enforce the strictest quarantine of the patient. A personal letter with reference to the control of the epidemic is to be sent to every physician in the state. July 5, responding to calls for assistance in identifying and controlling cases of infantile paralysis reported from the Hudson River counties, State Commissioner of Health Biggs detailed Dr. William B. May to visit Hudson, Beacon and Kingston.——Several suspected cases on Long Island are under inspection by Dr. Frank Overton, Patchogue, of the department staff.——At Freeport, Long Island, the local health officer is carrying on an extensive campaign of publicity.

New York City

Health Board Secretary Retires.—Eugene W. Scheffer, secretary of the New York Department of Health, has been retired on a pension after twenty-one years of service.

Floating Hospital Begins Work.—The *Helen C. Juilliard*, the new floating hospital, made its first trip, July 5. Trips to Seaside Hospital are made daily. The services of this boat are free and no sick child and its mother are denied admission, except in case of contagious disease.

Vaccines Sent to Border.—The bacteriologists of the department of health are busy filling orders for vaccines for the troops on the Mexican border. In addition to typhoid and smallpox vaccines and diphtheria antitoxin, glanders vaccine for testing horses is being sent in large quantities. Thromboplastin is also being manufactured in large quantities for use in checking hemorrhage. One hundred and fifty-one cubic centimeters of eye mallein have been sent to the Second Field Artillary at Van Cortland Park for use on new horses brought from the West.

Faculty Appointments.—The following appointments have been made to the medical faculty of New York University: clinical professors of surgery, Drs. Joseph B. Bissell, Thomas A. Smith, Walter C. Cramp and Arthur M. Wright; professor of clinical surgery, Dr. William C. Lusk; chief of clinic, department of surgery, college dispensary and instructor in surgery, Dr. W. Howard Barber; instructor in surgery, Dr. George Francis Cahill; clinical professor of medicine, Dr. Theodore J. Abbott; instructor in medicine, Dr. Hubert V. Guile; clinical professor of cancer research, Dr. Benjamin M. Levine; assistant professor of bacteriology and hygiene, Dr. Charles Krumiede, and instructor in bacteriology, Miss Mary Smeeton.

The American Posture League.—This organization held a joint meeting with the American School Hygiene Association in the auditorium of the Horace Mann School, Teachers' College, July 5. The program included the following papers:

"The Relation of Posture to Health," Dr. Eliza M. Mosher, Brooklyn; "Good Posture as a Condition of Efficient Brain Activity," William H. Burnham, Ph.D., professor of pedagogy and school hygiene, Clark University; "The Work of the American Posture League on School Furniture," Dr. Henry Ling Taylor, New York; "Eye Strain and Posture," Dr. Ellice M. Alger, New York; "The Relation of Clothing to Posture," Dr. Linnaeus E. La Fetra, New York; "An X-Ray Study of the Effects of Exercise, Posture, and Dress on the Position of Internal Organs," Dr. Nathalie K. Mankell, Buffalo; "The Importance of Intensive Work on School Hygiene," Lewis M. Terman, Ph.D., professor of education, Leland Stanford Junior University. Miss Jessie H. Bancroft, assistant director of physical training in the public schools of New York, demonstrated class-room methods for training correct posture.

Personal.—Dr. Thomas Darlington has been sent to the Mexican border under the auspices of the National Civic Federation to study the health of the enlisted men of the army and of the organized militia.——Dr. Arthur Zentler has been appointed visiting dental surgeon to the Lebanon Hospital.——Dr. Abraham Strachstein has been appointed chief of clinic and clinical instructor to the department of urology of Cornell University Medical College.——Dr. Rosalie Slaughter Morton sailed for Liverpool, July 8.——Dr. Charles S. Benedict sailed for San Juan on the Porto Rico liner *Brazos*, July 8.——Drs. Harry Plotz and George Bachr arrived home, July 7, after a time spent in Serbia, Bulgaria and Austria, during which they have been making further researches in typhus fever.——Dr. Henry T. Coggeshall has sailed for Bordeaux on the French liner *Rochambeau*.

The Poliomyelitis Epidemic.—The epidemic of infantile paralysis continues apparently unabated. For the week ending July 8, 892 cases have been reported, with 205 deaths. Thus far the death rate has ranged from 20 to 25 per cent., which is four times as great as it was in the epidemic of 1907. Nearly all the fatalities have occurred in children under 10 years of age, and the largest proportion occurs between the ages of 1 and 3 years. A daily list of patients with their addresses is published daily in the newspapers and parents are urged to read the list and to keep their children from the infected localities. At the request of the health commissioner the department of licenses has notified all moving picture theaters in the city not to admit children under 6 years of age until such a time as the board of health declares this health menace at an end. The department of health will not interfere with the regular summer school

classes or with the work of the fresh air funds, or with daily health excursions, such as are conducted by St. John's Guild where there is proper medical and nursing supervision. All promiscuous gatherings of children which do not include proper medical precautions are disapproved of. Sunday schools are expected to provide all the health safeguards that are exacted of all the secular schools. At a conference of health officials, held July 6, it was announced that Secretary McAdoo had offered the services of the United States Public Health Service to the city to help stamp out the epidemic. The offer was accepted and it was requested that the U. S. Public Health Service should take up specially the very difficult "carrier" problem and should make both field epidemiologic studies and laboratory studies with animal inoculations. A letter will be sent to all large hospitals having well equipped pathologic departments asking them to send material from fatal cases to the department for examination and research study. With the increase in the number of cases on Staten Island, it has been thought feasible to request the U. S. Public Health Service to perform the routine laboratory diagnostic work for the Staten Island cases at its laboratory at the quarantine station. There is a need for additional nurses at both the Kingston Avenue Hospital, Brooklyn, and the Willard Parker Hospital. July 6, there were 280 cases at the Kingston Avenue Hospital, and seventy-two at Willard Parker. The National Red Cross Society is cooperating with the health department and will provide additional nursing service.——Telegrams from New York, July 11, announce 195 new cases of infantile paralysis in the previous twenty-four hours, with 32 deaths, an increase of nearly 100 per cent. of new cases over the record of the preceding day, and a still larger proportion of deaths. Reports from the boroughs show that in Brooklyn there were 155 new cases with 20 deaths; in Manhattan 14 cases with 6 deaths; in Richmond 6 cases with no deaths; in the Bronx 7 cases with 3 deaths and in Queens 13 cases with 3 deaths. Thus it will be seen that east of the East River 168 of the 195 new cases occurred and 23 out of the 32 deaths. At present the total number of known cases is 1,278.——Secretary of the Treasury McAdoo, on Jully 11, asked for an appropriation of $135,000 to be used in the prevention of an interstate spread of infantile paralysis, from New York, and for the comprehensive research work to determine the cause and nature of the disease and the remedy for it. Of this amount $85,000 will be expended to prevent an interstate spread of the disease and $50,000 for research work.——President Wilson, on July 11, signed the joint resolution of Congress authorizing the use of the government hospitals on Ellis Island for the treatment of anterior poliomyelitis.

NORTH DAKOTA

Personal.—Dr. Robert C. Reimche has been appointed local surgeon for the Minneapolis, St. Paul and Sault Ste. Marie Railroad at Harvey.——Dr. Herbert J. James, Bathgate, is reported to be seriously ill in the Peter Bent Brigham Hospital, Boston.

Hospital News.—Bids were opened, June 14, for an addition to the Bismarck Hospital to cost about $50,000. This will provide quarters for nurses and sufficient accommodation for patients to increase the capacity of the institution one third.——An eight day campaign was inaugurated last month to raise $100,000 to apply on the building fund of the addition to St. John's Hospital, Fargo.——Improvements have been decided on for St. Luke's Hospital, Fargo, to cost $40,000. The new building will be a four story addition to the hospital which will house an obstetric department. The new unit will be ready for occupancy about January 1.——Nearly $11,000 has already been subscribed for a hospital at McVille, and the institution has been incorporated under the name of Community Hospital. The institution will be under the care of Drs. Arne O. Arneson and Andrew J. Paulson.

PENNSYLVANIA

Personal.—Dr. William S. O'Neill Sherman, Pittsburgh, sailed from New York, July 8, for Liverpool, to represent the United States Steel Corporation in the research work to be prosecuted by the Rockefeller Institute in the base and field hospitals of the allies.——Dr. William M. Hall, Conshohocken, who has been under treatment at the University Hospital, Philadelphia, is reported to be critically ill.——Dr. Eileen J. Giles, Reading, has been appointed head physician of the Altapass Hospital, North Carolina.

Philadelphia

Personal.—Dr. Henry L. Picard, who has for twenty years been a visiting physician to the Wills Eye Hospital, has resigned.——Drs. Alfred C. Wood, John G. Leitch and John A. Murphy, members of the Medical Reserve Corps of the United States Army, have been ordered to the Texas border.

Medico-Chirurgical College Passes Into History.—After thirty-six years as an undergraduate school of medicine, the Medico-Chirurgical College closed its doors, June 30. The college buildings have been closed, except the office of the dean. The final papers in the merger with the University of Pennsylvania have been signed.

Ice Cream Fund for Hospital.—Dr. Wilmer Krusen of the department of health and charities has asked citizens to contribute to a fund to provide ice cream for patients in the tuberculosis wards of the Philadelphia General Hospital. This would cost about $300 to feed them during the months of July and August, twice a week. The city cannot provide this money, so Dr. Krusen has called on the people to raise a fund.

Negro Physicians Meet.—The Interstate Association of Colored Physicians, Dentists and Druggists was held in this city, July 13-15. Five hundred delegates from New York, Pennsylvania, New Jersey, Delaware, Maryland, Massachusetts and the District of Columbia were present. The meeting was held in the Philadelphia Academy of Medicine. Dr. Nathan F. Mossell of this city is present. The committee who had charge of the arrangements were Drs. George L. Carson, Benjamin Whithers and Charles A. Lewis, Philadelphia.

TEXAS

Pellagra Commission.—The first meeting of the Commission for the Study of Pellagra appointed by the chairman of the Doctors' Luncheon Club, Fort Worth, was held, June 12, under the chairmanship of Dr. Wilmer L. Allison, Fort Worth.

Personal.—Dr. Oliver H. Radkey, Edna, for several years health officer of Jackson County, has resigned and Dr. Garrett Hogg has been appointed his successor.——Dr. Walter H. Moursund, Dallas, has been appointed pathologist of the city board of health.

Health Survey.—The commissioners of Harris County, June 26, made an appropriation of $2,400 for a complete health survey of the county. The Rockefeller Commission has appropriated a similar sum and the work will begin during the latter part of August.——Dr. Platt W. Covington, Austin, will be in charge of the work, which will include the inspection of homes; the delivery of popular lectures on germ diseases, especially hookworm and malaria; the inspection of sanitary conditions; and advice to the people of the county regarding health conservation.

UTAH

State Public Health Association Organized.—The Utah Public Health Association was recently organized at Salt Lake City with all lay officers, with the exception of Dr. Horace G. Merrill, Provo, assistant secretary-treasurer. The directorate includes a number of physicians of Salt Lake City and other parts of Utah.

Personal.—Dr. Samuel G. Paul, Salt Lake City, has been appointed assistant physician of Salt Lake County.——Dr. Ezekiel R. Dumke, Ogden, has been appoointed local surgeon of the Ogden, Logan and Idaho Railway at Ogden, succeeding the late Dr. Charles F. Osgood.——Dr. Daniel H. Calder, for eleven years superintendent of the State Mental Hospital, Provo, resigned, taking effect May 20.

VIRGINIA

License Fee for Physicians Raised.—The council of the city of Suffolk, June 15, passed the license tax ordinance which changes the annual license fee of attorneys at law, physicians and dentists from $20 to $25.

Contagious Hospital Donated.—Mr. James H. Dooley, Richmond, has agreed to contribute $40,000 to pay the entire cost of the erection and equipment of a contagious hospital, to be connected with the Memorial Hospital.

Health Survey of Fauquier County.—The Board of Supervisors of Fauquier County have voted $300 to assist in the expenses of a health campaign in the county. The state board of health has contributed $900 for this purpose and will assign officials who will go through the county giving instructions in health and sanitation.

Soldiers' Families to Have Free Medical Care.—At a meeting of the Augusta County Post-Graduate Medical School, held at Staunton, June 21, a resolution was adopted tendering the gratuitous services of the Augusta County Medical Society to the dependent families of enlisted men serving in the National Guard from Augusta County and the city of Staunton when so requested by a family or any member thereof.

Personal.—Dr. Robert V. Palmer, Cherrydale, has been appointed full time health officer of Alexandria County. Drs. Richard N. Sutton, Clarendon, and Robert M. Slaughter, Seminary Hill, were also made members of the health board of the county.——Dr. Albert P. Traynham, Richmond, assistant bacteriologist of the state board of health, has been transferred from the laboratory of the board and directed to complete an inspection of summer resorts and summer resort cities.

Loving Cup to Health Board.—The members of the board of health of Richmond, which went out of existence July 1, were given a silver loving cup by the officers and men of the department, June 26. Chief Health Officer Ernest C. Levy made the presentation speech and Dr. William T. Oppenhimer was made the custodian of the cup, which bore the following inscription: "To the board of health of the city of Richmond, retiring aften ten years of faithful service, from those best able to value that service, the men in the department." On the reverse side of the cup were inscribed the names of the members of the board.

New Appointees on State Board.—Governor Stuart, June 1, in compliance with an amendment passed at the last session of the legislature, which provided for two additional members of the state board of health, named Capt. W. W. Baker, Chesterfield County, and Guy R. Harrison, D.D.S., Richmond, to serve for a term of four years on the board. Under the old statute, twelve physicians selected from the membership of the Medical Society of Virginia, one from each congressional district in the state, and two from the city of Richmond, constituted the state board of health. Senator West's amendment provided for the addition of two members, one a member of the State Dental Association and the other a layman.

WISCONSIN

Personal.—Dr. William W. Gregory was elected president of the newly organized board of health of Stevens Point, and Dr. C. Von Neupert, Sr., was reelected health officer.

Health Officers to Meet.—Health officers of Wisconsin and many physicians and laymen from outside the state will attend the third biennial conference of health officers in the state capitol, Madison, August 2 and 3. The program includes a wide range of topics relative to public health administration and questions of sanitation and hygiene.

CANADA

Restriction on United States Graduates Removed.—At its recent meeting the council of the College of Physicians and Surgeons of Ontario eliminated from its regulations the requirement that graduates of recognized medical colleges of this country must have attended "one or more full winter courses of lectures in one of the regular medical schools in Ontario" before being eligible to take the examination for a license to practice in that province. It is reported that a standing committee, consisting of the education committee and representatives of the College of Physicians and Surgeons of Ontario will select a list of "recognized" colleges.

Personal.—Capt. Jay Boyd, A. M. C., Capt. Gordon S. Foulds, and Capt. Walter J. Kirby compose the Niagara Camp Medical Board this year.——Lieut.-Col. Herbert J. Hamilton and Maj. Charles J. Currie, Toronto, are to compose the medical board in connection with the Toronto School for Instruction.——Capt. Charles E. Treble, Toronto, has been appointed to the hospital at Exhibition Camp, Toronto.——Dr. William Oldright has returned from Chicago to his home in Toronto.——George S. Gordon, Vancouver, B. C., has left for medical service abroad and will not return until after the war.——Col. John Taylor Fotheringham, Toronto, has been made a Companion of the Order of St. Michael and St. George.——Dr. Harold Y. McNaught, San Francisco, has been visiting his father in Toronto.

Hospital News.—Announcement is made of the creation of the Canadian Hospitals Commission as a branch of the Canadian Expeditionary Forces with more strict jurisdiction in connection with convalescent homes and military hospitals. Under this commission a new hospital unit has been organized for the purpose of securing military discipline, administration and command. It will be divided into ten divisions, one for each military division in Canada. Each hospital or convalescent home will be in charge of a major and a subordinate officer subject to the Hospitals Commission in Ottawa. The new unit will be in charge of Lieutenant-Colonel Sharples, Quebec.——A new hospital in Port Hope, Ont., was opened, June 29. It was made possible by the bequest of Mr. John Helm.——Six wings of the Canadian Hospital at Bushey Park, England, have been completely furnished by the Canadian Red Cross. Each wing will bear the name of one of the king's children.

Ontario Medical Council.—The annual meeting of the Ontario Medical Council was held in Toronto the last week of June. Dr. Edmund E. King, Toronto, was elected president and Dr. H. Wilberforce Aikins, Toronto, was reelected registrar-treasurer. One of the outstanding features of the meeting having to do with medicine generally was the adoption of a resolution, proposed by Dr. Herbert J. Hamilton, Toronto, that the members of the Medical Council of Ontario desired to place on record their appreciation of the discovery of serum therapy by Dr. (now Sir) James A. Grant in the County of Carleton General Hospital, Ottawa, in 1861, and the credit only recently announced (*Lancet*, London, May 20). "We are really proud of the honor and glory achieved by our sons in the battlefield for king and country; and to gain the highest position in the world in medical science is a record alike creditable to Canada and our institutions of learning."

Clause 51 of the Ontario Temperance Act was fully discussed, the president claiming that it placed the medical profession in the province in the class of bartenders, as a physician could dispense either an ounce of whisky or a dozen of ale. The council decided to call the attention of the profession to this clause and the necessity of adhering to it with decorum and dignity. The fact that fifth-year medical men are engaged by contracting physicians and farmed out to the lumber camps in northern Ontario came in for extended discussion, and it was decided to refer the whole matter to the commissioner now inquiring into medical law and education in the province. The report submitted by Dr. Arthur Jukes Johnson, Toronto, stating that there is no immediate reason why midwives in Ontario should be licensed was adopted.

GENERAL

New Proctologic Officers.—At the annual meeting of the American Proctologic Society, held in Detroit, June 12, under the presidency of Dr. T. Chittenden Hill, Boston, the following officers were elected: president, Dr. Alfred J. Zobel, San Francisco; vice president, Dr. Granville S. Hanes, Louisville, Ky, and secretary-treasurer, Dr. Collier F. Martin, Philadelphia.

Bequests and Donations.—The following bequests and donations have recently been announced:

Yale University School of Medicine, New Haven, Conn., $14,845, by the will of Norman B. Bayley.

For the equipment of a 500-bed base hospital to be used in the event of war with Mexico, a donation of $50,000, to be placed at the disposal of Dr. Samuel Lloyd, New York, by Edward B. Close.

Columbia University, and Mt. Sinai Hospital, New York, each $20,000; Presbyterian Hospital, New York, $12,500; Stony Wold and Loomis sanatoriums, and New York Skin and Cancer Hospital, each $10,000; St. Luke's Hospital and Montefiore Home and Hospital, New York, each $5,000, and German Hospital and Dispensary, $2,500, by the will of Emile C. Bondy.

Mayo Clinic Alumni Meet.—The first annual meeting of the Association of Resident and Ex-Resident Physicians of the Mayo Clinic was held in Rochester, Minn., June 9 and 10. A surgical clinic was given at the hospital, and in the evening papers were read. At the banquet the following officers were elected: president, Dr. Harold L. Foss, Danville, Pa.; vice president, Dr. Donald C. Balfour, Rochester, Minn.; secretary, Dr. William C. Carroll, St. Paul; treasurer, Dr. Arthur H. Sanford, Rochester, Minn., and governors, Drs. Edward S. Judd and William F. Braasch, Rochester, Minn., and Otis F. Lamson, Seattle.

Men Wanted for Public Health Service.—Additional medical men to examine refugees from Mexico, and to care for Mexican prisoners in event of hostilities are being sought by the United States Public Health Service. Examinations for physicians and surgeons will be held in the principal cities of the country probably early this month, it is announced.

Typhus fever, smallpox, and yellow fever are to be guarded against particularly, and it is feared these diseases may be carried either by refugees who will be landed at American

ports or by Mexicans who may be brought across the border.

Fellowships in District Work.—The Harvard Medical School is reported to have established four fellowships in medicine, to be known as the Boston Dispensary Fellowships. Applicants must have graduated from a medical school of good standing and must have had a hospital internship or its equivalent. Appointments will be made jointly by the authorities of the Harvard Medical and of the Boston Dispensary. Application can be made to either of these bodies. The fellows will be expected to give a portion of their time to treating the sick in their homes in the district service of the Boston Dispensary, and a portion of their time to such study, teaching, laboratory, research or clinical work as may be assigned by the medical school. The stipend of a fellowship will be $500 for part time, or $750 for the physician's entire time. A physician desiring to pursue postgraduate study of a course in public health work might be enabled through such a fellowship to complete a course in one or two years while receiving at the same time valuable experience.

Confederate Surgeons Meet.—The nineteenth annual meeting of the Association of Medical Officers of the Army and Navy of the Confederacy was held in Birmingham, Ala., May 16. The old constitution was repealed and a new constitution adopted. The objects of the association were stated to be: to collect all data possible relating to the medical department of the army and navy of the Confederate states; to ascertain the military record of all officers and prepare a roster of same; to honor the memory of its deceased members, and otherwise to perpetuate the history of the medical department of the army and navy of the Confederate states. It was reported by the committee on roster that during the Civil War there were nominated by President Davis, and confirmed by the senate, one surgeon-general with rank of brigadier general of cavalry; 1,242 surgeons with rank of major of cavalry, and 1,994 assistant surgeons with rank of captain of cavalry, a total of 3,237 medical officers in the Confederate Army. The medical department of the Confederate Navy consisted of twenty-six surgeons, thirteen passed assistant surgeons, sixty-three assistant surgeons, and five assistant surgeons of war, a total of 107. The following officers were elected: president, Dr. Carroll Kendrick, Kendrick, Miss.; vice presidents, Drs. James C. Loggins, Ennis, Texas, and Edward H. Sholl, Birmingham, Ala., and secretary-treasurer, Dr. Samuel E. Lewis, Washington, D. C. The next meeting of the association will be held in Washington, D. C.

FOREIGN

Deaths in the Profession Abroad.—O. von Herff, professor of obstetrics and gynecology at the University of Basel, succumbed to sepsis from an operative infection, aged 60. He was born in Mexico of German parents and studied medicine first at Mexico City, concluding his course in Germany and serving as assistant at Giessen, Darmstadt and Halle before being called to the chair of obstetrics and gynecology at Basel in 1901. He was on the editorial staff of several specialist journals and published a number of articles on eclampsia and other questions of the day. He introduced the acetone-alcohol method of sterilizing the hands.——H. de Toledo Dodsworth, professor of physical measures in therapeutics at the University of Rio de Janeiro, aged 51. He was a member of the editorial staff of the *Brazil Medico*, was instrumental in the introduction of vaccination into Brazil, and took an active part in the stamping out of bubonic plague, and published numbers of articles on electrology, Roentgen diagnosis and other forms of physiotherapy.

WAR NOTES

Doctors Wanted for London Military Hospitals.—Dr. Joseph A. Capps, Chicago, reports that a cablegram from Sir William Osler states that first class physicians and surgeons are wanted at once for six months' service in London military hospitals. Liberal terms are offered. For further information communicate with any of the following committee: Drs. Richard C. Cabot, 1 Marlboro Street, and Henry A. Christian, C. Frothingham, Jr., and Francis W. Peabody, Peter Bent Brigham, Hospital, Boston; Drs. Warfield T. Longcope, George E. Brewer and Karl Vogel, Presbyterian Hospital, New York; Drs. Wm. S. Thayer, 406 Cathedral Street, Joseph C. Bloodgood, John Hopkins Hospital, and Thos. R. Boggs, 21 West Chase Street, Baltimore, and Drs. Dean D. Lewis, Presbyterian Hospital, Arthur A. Small, 32 North State Street, and Joseph A. Capps, 122 South Michigan Boulevard, Chicago.

WORK AT A BASE HOSPITAL IN FRANCE

To the Editor:—After nearly two years of concentrated and unprecedented warfare, the service of the medical corps of European armies has become crystallized into a high degree of efficiency. Your readers may be interested in base hospital work of a general character with its smooth organization and trained corps, and no better example can be offered than the work and results of the Chicago Unit, British Expeditionary Force, France. When one speaks of a base hospital, it must be understood that distances within the "zone of the armies" in France are not great, the transportation is rapid and excellent in the special Red Cross trains brought over from England, and the methods of handling the wounded from casualty clearing stations to hospital beds has become finely systemized. On certain occasions the base hospital in France may find an enormous number of freshly wounded poured into its service, and then it becomes in reality a clearing hospital, accepting and dressing all patients, operating on as many as possible of the seriously injured, and turning them out in a few hours to hospital ships for transportation across the channel.

Such periods of stress call for the utmost effort on the part of all connected with the hospital; there is no cessation of work, and efficiency is gaged by the rapidity of the in and out flow of carefully but quickly treated wounded. To meet these demands there must be a careful system of distribution of cases, and large amounts of supplies, and the essential records must be made to aid the medical officers at the place of final distribution in the home land. Medical officers must be able to act intelligently and independently to a certain degree, in the wards under their care, and the operating room force must be tireless and snappy in procedure and diagnosis. To obtain this possible rapidity, and to obviate time consuming stretcher trips, serious cases are weeded out in the convoy of arriving wounded and kept in wards communicating directly with the operating theaters. The exact number of beds in these and all wards must be known and be before the medical officer in charge, and as the number of stretcher and ambulatory cases in any given convoy is known before its arrival, the distribution proceeds in a rapid, orderly manner.

We have found it essential to this rapid work to obtain the full details of name, regiment, number, etc., from the patients as soon as they are brought into the receiving hut, three or more officers working at the task, while all patients, after card and diagnosis entry, pass before the medical officer in charge for a final checking and for bed distribution. Soldiers tired by days of fighting and shellfire, the shock of wounds and transportation, when placed in bed without obtaining this much needed information, fall into prolonged sleep and will not be aroused to answer intelligently. With thirty bed wards the system works so smoothly that a convoy of 200 wounded men, for instance, can be brought to the hospital by motor ambulance from train, the essential details of the case recorded, and all be in their beds in assigned wards in an hour and a half. Imagine the confusion in an ordinary city hospital not prepared for such a rush of business if 200 patients were suddenly thrust on them.

In twelve hours following, the whole could be evacuated if necessary with wounds dressed, histories written and many of the seriously wounded operated on, and a fresh batch taken in.

So much for the first difference between the surgery of war and that of peace, the factor of military discipline explaining the rapidity and order of hospital service. We must then consider the types of wounds and other maladies that appear for attention, and possibly digress slightly to consider in general what may be expected after several days' hard fighting in modern trench warfare. Fauntleroy (Report under direction of the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., 1916), has given a clear general view of the various types of missiles in use and their ballistics. The surgeon must care for projectiles from arms used in the trenches, such as rifles, hand grenades,

high explosive bombs, machine guns and asphyxiating gases. To these must be added the missiles from artillery fire, mainly high explosive 3-inch shells and shrapnel. The bayonet, sabers and the cavalry lance also cause wounds. The bullet of the Teutonic forces is ogivocylindric, and at the present time has been reduced in size to about 8 mm. in cross section, with a weight of 10 gm. It has a high initial velocity but a lower sectional density than the bullet of the Allies, and is therefore considered ineffectual at ranges when the latter bullet is still dangerous. At short range, on account of the rotation induced by the rifling, it has theoretically great explosive effect, and is subject to deformation and fragmentary splitting when striking hard objects. In practice this rule does not hold absolutely. One finds rifle bullet wounds caused by close range fire which are cleanly penetrating even through the large bones without fragmentation, while I have removed bullets fired at long range which became broken and were stopped in the tissues after striking smaller bones, as the ribs, and had explosive effects. Various factors, moreover, as ricocheting, may affect any single gunshot wound; but generally at extreme ranges when a bullet enters and involves the soft parts alone the wound and entrance channel are the same size as the bullet. At close range the tendency is toward an explosive effect and complete in and out penetration of the missile. The wound of entrance is smaller, and the wound tract is funnel-shaped with the small end directed toward the entrance. This characteristic wound is doubtless influenced by the following conditions:

1. The tissues are unable to separate quickly enough to allow a high velocity bullet to progress through without pushing before it some pieces of clothing or the tissues it traverses, an accumulation of which in its flight produces a larger channel as it nears its exit.

2. If it strikes bone, bullet and bone fragments may act as secondary missiles to enlarge the wound at the exit.

3. Rotatory spin of the bullet from the rifling, together with some of the forward motion, is transmitted to the surrounding soft parts, as demonstrated some years ago in Horsley's experiments to cause a larger area of wound channel. This explains the comminution of bone and the frequent driving deep into the tissues of bony pieces at right angles to the wound tract.

The effects of missiles on bone will be considered at another time. Machine guns shoot the ordinary rifle service cartridge, and consequently cause wounds of the same character.

Artillery fire is used mainly with two types of shell, the 18-pound high explosive and the shrapnel. These shells have a muzzle velocity of nearly 2,000 feet per second, a range of 6,500 yards, and a flight duration of from eighteen to twenty-five seconds, exploding both by time fuse and contact. In a shrapnel casing, moreover, are placed irregular bullets some one-half inch in diameter, lead or iron, averaging over 300 in number, which on explosion are given a secondary velocity of 250 feet per second and scatter with the pieces of steel shell casing. Intense smoke accompanies their explosion from combustion of red amorphous phosphorus and powder so that they can be used as markers for directing further fire, making it possible to shell every square yard of a given area. Inasmuch as these shells can be fired at a rapidity of from fifteen to twenty-five a minute, one can imagine the rain of projectiles, the noise and force of explosions to which men in the trenches are subjected, and the necessity for dugout shelters in connection with the sand-bag protection in front of a trench. In surgical wounds caused by these shells we do not find so many of the bullets, but more often find the pieces of steel casing, so that the high explosive shell which by its concussion will hurl a man 30 feet in the air has become more generally used than the pure shrapnel shell. The mere force of its explosion may cause death to the soldier without producing any wound, or exposure to repeated shelling, often for several days' duration, may induce a condition known as shell shock or "shock shell" leading to extreme neurasthenia. The explosion has been measured to have a pressure effect of about 10 tons to the square inch in its direct path. Men may be so pressed on one side of the chest (cardiac) or the abdomen by the air vibration that death ensues from reflex causes, or they are found standing upright in trenches, dead with no wounds, possibly having been pressed against the trench wall and squeezed to death. Corresponding to the tremendous pressure of the explosion, there follows a relative vacuum formation in the vicinity, and it has been ingeniously suggested that this vacuum may cause death much as in caisson disease on sudden release from pressures of several atmospheres. The pathologic condition may be multiple areas of hemorrhage in the brain, or possibly the sudden release of pressure may cause the nitrogen suspended in the blood serum to come out of the solution as bubbles which block end arteries in the brain or impede heart action.

Shell and shrapnel wounds cause lacerations and contusions and destruction of tissue. The soft bullets tend to mushroom, bits of clothing and flesh are carried deep in, and infection usually follows.

Hand and rifle grenades cause similar wounds and are used at close range in the trenches where rifles cannot be employed. Dirt, clothing and fragments are carried into the tissues so that there are great destructive effects and infection is sure.

Bayonet wounds are often multiple, some are accidental and very few of the wounded reach the hospitals, because in close fighting which permits this type of offense, death is the usual result before any medical treatment can be offered. These wounds are in the chest, abdomen and groin, and are a penetrating stab. Fauntleroy states that they constitute, with the wounds of the cavalry lance, about 5 per cent. of the injuries, whereas among the 98,000 wounded in the Franco-Prussian War of 1870, there were only 600 thrust wounds. Sabers cause thrusting and slashing wounds, often multiple and placed about the head, left upper arm, and right forearm or elbow, whereas the thrusts of the cavalry lance are nearly always in the trunk.

Asphyxiating gases are mostly chlorin or bromin compressed to liquid form, and phosgene has been used in some mixtures lately. Because they are heavy, they roll along the ground surface and sink into the trenches. When inhaled in concentrated form, they may cause death at once; but in milder concentrations they cause cough, eye watering and dizziness. Every soldier on active duty is provided with a gas helmet or protection which aims to neutralize the toxic effects of the gas, and has in addition close fitting spectacles, which give protection to the eyes. After inhalation of the gases a bronchitis quickly develops, there is a hypersecretion of mucus, and the alveolar spaces are filled up. There may be found an edema of the glottis, or the heart suffers an acute dilatation from efforts to pump blood through the clogged lungs. Postmortem examinations verify these findings and show areas of bronchiectases. Young men with strong hearts give more promise of surviving exposure, and may last for three or four days before they succumb.

The men are cautioned not to exert themselves after being gassed, but to lay aside all equipment, loosen clothing, and lie quietly in a prone position to favor lung drainage. Treatment is given with oxygen gas, atropin and cardiac support. Occasionally there are serious burns from injuries incident to accidental premature explosions or from the flame projectors (*Flammenwerfer*), which throw a burning liquid nearly a hundred feet and cause deep sloughing of exposed parts.

In all wounds the most feared complications are gas infections from anaerobic bacteria, with which the highly fertilized soil of the fighting area teems, tetanus, and secondary hemorrhage from vessel softening. As a rule the men are in excellent physical condition to withstand battle and surgical shock and to exhibit recuperative powers, and have been trained for months for physical endurance. They have also been deprived of much alcoholic drink. Antitetanic serum is used in every case, each wounded man is given 1,500 units, and is marked on the forehead or wrist with a T by an indelible pencil, so that the base hospital knows of the injection in case the casualty card is lost.

Steel helmets have reduced the number of head injuries greatly, or else modified many of them into less harmful concussions and minor scalp injuries, on which I hope to report later.

Kellogg Speed, M.D., Chicago,
On active service with the British Expeditionary Force in France.

LONDON LETTER

London, June 19, 1916.

The War

THE ORGANIZATION OF THE PROFESSION IN RELATION TO THE ARMY AND THE NEEDS OF THE CIVIL POPULATION

As explained in a previous letter, compulsory military service now applies to the whole male population up to the age of 41, including physicians. The latter have the option of taking commissions in the Army Medical Corps. The question of deciding whether the needs for the civil population allow a physician to be called up is decided by the Central Professional Committee in conjunction with a local professional committee. The procedure is that when a physician is selected for service he receives a notification from the Central Professional Committee, and, if he is of any opinion that his personal or professional circumstances, or any other considerations, would justify his claiming to be left in his civil practice till a later date, or even throughout the war, he must communicate at once to the same central committee. He will then receive from the central committee a statement of its procedure for considering his case, and of any further information which they may require from him; and in due course the committee, after consulting the local committee, and after hearing the physician if he so desires, will make a final decision. In cases in which the physician is on the staff of a hospital or medical school in the London County area, the central committee will hand on the physician's application to the Committee of Reference (appointed by the Royal Colleges of Physicians and Surgeons for the consideration of such cases). If it is decided that the physician is not then to be taken, or not to be taken till some specified later date, he will be informed accordingly by the central committee; and in any event he will be given at least a month's notice of the date of commencing service. If, on the other hand, he is selected, he will be given by the War Office, on the date indicated to him by the central committee, a commission in the Army Medical Corps. His service will on that occasion be for a period not longer (unless he is willing) than twelve consecutive months. Before the war the physician was able at the end of the period of his commissioned service in the Army Medical Corps to return to civil life with no further obligations. But the military service acts make an important difference; for now, on his return to civil life, compulsion still applies to him, and, if he does not at once enroll again, so as to obtain the conditional immunity from calling up, he will necessarily be called up for ordinary service by the military authorities, and will be able to obtain exemption (if at all) from such service only through the procedure described below. He will come again into the position of being among those from whom the Central Professional Committee can select physicians for service in the Army Medical Corps. The physician under 41 who does not enroll voluntarily (under the scheme described in previous letters to The Journal) is liable to be called up for ordinary combatant service. If he desires exemption, his claim will come before the Central Professional Committee, which will decide whether or not he is to remain in civil practice. If it is decided that he should not, he will be offered a commission in the Army Medical Corps (unless considered unsuitable). So far his lot is not very different from the man who has voluntarily enrolled. But there are the differences that he loses the special arrangements as to pay, twelve month periods, and other privileges given to those who enroll voluntarily.

Physicians over 41 but not more than 45 are not liable to compulsory service but they are asked to enroll and undertake to accept a commission in the Army Medical Corps. Finally, the War Office has now extended the age for the entry of physicians into the Army Medical Corps. Men between 45 and 55 are required for whole time service in the United Kingdom so as to set free the younger men for service abroad. A certain number of physicians between the ages of 45 and 55 have volunteered for service abroad and are being sent to the Mediterranean.

THE HIGH PRICES OF FOOD

The price of food has been increased since the war, according to the government report, to the extent of 53 per cent. Comparison of the prices of meat, June 1, with those in July, 1914, shows that, while the increase in the prices of the better cuts of British meat average between 50 and 60 per cent., the cheaper cuts of imported meat have doubled in price. Bacon is nearly 40 per cent. dearer than in July, 1914, and fish averages 86 per cent. dearer. Increases of from 50 to 60 per cent. are recorded for potatoes, flour, bread, cheese and tea. The price of granulated sugar remained about two and a half times that prevailing immediately before the war. Milk and butter show advances of about 30 per cent., margarin an increase of 18 per cent. It is estimated that the average increase in the cost of living of the working classes, taking food, rent, clothing, fuel and light, etc., into consideration, between July, 1914, and the present time is about 40 per cent. However, in consequence of abundant employment at high wages, due to the great demand for munition workers and the scarcity of labor produced by the formation of a huge army, the working classes are better off than before the war. It is the middle and upper classes who are bearing the burden of the war. This increase of prices may be compared with those of Berlin since July, 1914, which amount to 119.8 per cent., and those of Vienna, amounting to 221.5, which, as far as one knows, are not compensated by any increase in wages.

CANADIAN PHYSICIANS ON WAR SERVICE

The patriotism and self-sacrifice which have led a large number of Canadian physicians, many of them holding leading positions, to throw to the winds flourishing practices, the result of years of labor, are remarkable. Among these men may be mentioned Colonel Adami, the distinguished pathologist of McGill University; Colonel Elder; Colonel McCrae; Colonel Archibald; Colonel Cameron, one of the best known surgeons in Montreal; Colonel Findley, professor of medicine in McGill University, and Major Meakins and Capt. Thomas Cotton, the cardiologists, who are now attached to the Hampstead Hospital for the Study of the Soldier's Heart. Toronto has sent, among others, Colonel Primrose, the well known surgeon, and Colonel Cameron; while from Kingston has come Colonel Fotheringham, and from St. John, Col. Murray MacLaren.

The Falling Birth Rate

The falling birth rate has exercised public men so much that in 1913 a national birth rate commission was formed by the National Council of Public Morals to report on its causes and effects. The commission included leading physicians, clergymen, philanthropists and social reformers. For the greater part of the time Bishop Boyd Carpenter was the chairman, and he was succeeded by Dean Inge, both eminent and well known churchmen. The evidence taken by the commission, with the report, forms a volume of 450 pages, which has just been published and must be regarded as the most authoritative work on the subject.

The commission considers the following propositions definitely established:

1. The birth rate has declined one third within the last thirty-five years.

2. The decline is not to any important extent due to alteration in the marriage rate, a rise in the mean age at marriage, or to causes diminishing the proportion of married women of fertile age in the population.

3. This decline, although general, has not been uniformly distributed over all sections of the community.

4. On the whole, the decline has been more marked in the more prosperous classes.

5. The greater incidence of infant mortality in the less prosperous classes does not reduce their effective fertility to the level of that of the wealthier classes. The following conclusions, although based on evidence less substantial than the previous ones, are also considered sufficiently well established:

6. Conscious limitation of fertility is widely practiced among the middle and upper classes, and there is good reason to think that in addition to other means of limitation, the illegal induction of abortion frequently occurs among the industrial population.

7. There is no reason to think that the higher education of women (whatever its indirect effects on the birth rate may be) has any important effect in diminishing the physiologic aptitude to bear children.

The commission criticizes the argument that an improvement in the birth rate would be facilitated by such conditions as

greater security and regularity of income, with insurance against unemployment among all classes of workers. This view, they point out, is not supported by statistics. Not only do the more well-to-do classes restrict their families more, but even among certain wage-earning classes the birth rate varies inversely with the income. The clerical witnesses were almost all opposed to the use of mechanical and chemical means to prevent conception, but there was not the same unanimity as to the morality of restricting the family in other ways. Some of the representatives of religion signed a minority report condemning mechanical and chemical preventives injurious to health, but making a reservation as to methods not injurious to health. A number of proposals of an economic character are also put forward to enable a larger population to be supported. They include a living wage, bonuses for families under certain conditions, relaxation of income tax, increased facilities for good education, adequate housing accommodation at reasonable rents, and measures to encourage the full development of natural resources both at home and beyond the seas. Mr. Long, the president of the Local Government Board, is about to receive the commission as a deputation, when the report will be presented to him.

British Science

In proposing a vote of thanks to Sir Andrew Fisher, Surgeon-General Sir Alfred Keogh, Director-General of the Army Medical Service, said that we had in this country as able and energetic scientific men as any in Europe, and were, in many respects, far in advance of the scientific men of the world for the simple reason that our men had the invaluable quality of initiative. It was our misfortune that our people did not take full advantage of our scientific work. Happily, there were some directions in which we had not failed in that sense, as he could testify from the experience he had gained in the work on which he was engaged in this war. We had drawn into the fold all the scientific men who could assist us, and what was the result? In our army, large as it was, there were, today, only twenty-two cases of typhoid fever, whereas if we had gone on in the old way there would probably have been 80,000, 90,000 or even 100,000.

PARIS LETTER

PARIS, June 15, 1916.

The War

COMPULSORY ANESTHESIA IN THE MILITARY SERVICE

In a previous letter I noted the instructions which the minister of war issued with regard to the refusal by soldiers of necessary operations or other treatment (THE JOURNAL, Aug. 21, 1915, p. 729). The right to refuse a cutting operation is recognized as absolute from a legal point of view because every such operation implies a certain risk. Is this true, however, for simple anesthesia not followed by operation? This question has been raised before the Académie de médecine by Dr. Reynier of the Faculté de médecine de Paris. He proposes to render compulsory the administration of chloroform to soldiers whenever the physician treating the case shall judge it necessary for the purposes of diagnosis or of treatment. At present it is not possible to compel a soldier to submit to anesthesia. For this reason it is often impossible to detect malingerers or to demonstrate the hysterical nature of certain contractures, and one is therefore often obliged to discharge men who might well be cured and who are perfectly fit to take their place in the ranks. Now, Reynier is of the opinion that, thanks to improved technic, the administration of chloroform presents no longer any real danger. In these conditions the respect for the individual will which rules in civil life cannot be held compatible with military discipline.

Professor Quénu remarked that postchloroformic sequelae are by no means negligible and that therefore we have no right to ignore the wishes of the patient. Professor Kirmisson associated himself with this protest of Quénu's. Dr. Vaillard, inspector-general of the health service of the army, pointed out that it is not possible to compel soldiers to submit to anesthesia in the same manner as they must to vaccination against smallpox or against typhoid, in the absence of a special law such as exists for these other cases. In view of the complexity of the question, it has been submitted, on the proposition of Dr. Delorme, inspector-general of the military health service, to a special commission.

LEAD POISONING FROM RETAINED FRAGMENTS OF BULLETS

At a meeting of the Société médicale des hôpitaux, Dr. Loeper, of the Faculté de médecine de Paris, and Dr. Verpy drew attention to the fact that symptoms of poisoning may develop in patients owing to absorption of lead from fragments of lead projectiles retained in the body, especially in the lungs. For this reason, though the diagnosis in such cases is sometimes difficult owing to the complexity of symptoms produced by the injury, the presence in the tissues of a lead projectile should not be neglected.

AMERICAN SURGICAL DRESSINGS COMMITTEE

The Surgical Dressings Committee, founded in the United States in October, 1914, to distribute surgical dressings gratuitously in the hospitals of France and allied countries, has established two sections in France, one at Bordeaux and the other at Paris. The latter is installed at rue de la Faisanderie, 118, in a large building kindly placed at the disposition of the committee by Mme. G. Coulon, and it has recently been visited by M. Justin Godart, undersecretary of state for the military health service.

Epidemic of Whooping Cough at Paris

A very serious epidemic of whooping cough has prevailed at Paris for some time, causing from twenty to twenty-five deaths a week instead of the mean rate of seven. At the Académie de médecine, Dr. Paul L. Tissier drew attention to the gravity of this epidemic and to the numerous cases which have occurred among adults. According to Tissier's own observations in this epidemic, the adult more often transmits the sickness to the child than the child to the adult, which is the contrary of what is usually the case. It is therefore necessary in the present circumstances to take precautions to prevent this contagion, especially in the case of soldiers on furlough who may propagate the epidemic among the troops at the front.

Death of Dr. Dubief

Dr. Fernand Dubief, deputy for the department of the Saône-et-Loire, and former minister, has died suddenly at the age of 66. He was formerly director of an asylum for the insane at Marseilles and afterward at Lyons. He was elected to the chamber for the first time in 1893. He was reelected at each of the general elections of 1898, 1902 and 1906. He lost his seat in 1910, but was again returned in 1914. He was minister of commerce in the Rouvier cabinet in 1905, and afterward minister of the interior in the same cabinet from Nov. 12, 1905, to March 14, 1906. Dubief had a large share in the preparation of the law concerning lunatics as well as in the elaboration of the tariff for medical fees for industrial accidents. The latter tariff is therefore known as the Dubief tariff.

Death of Dr. Rommelaere

The death is announced, at the age of 80, of Dr. Rommelaere, professor at the University of Brussels, and president of the administration council of that university.

BUDAPEST LETTER

BUDAPEST, June 14, 1916.

The War

EXAMINATION PRIVILEGES ALLOWED TO MEDICAL STUDENTS DURING THE WAR

The Minister of Public Instruction issued an order, March 6, 1916, according to which medical students who are fit for military service enjoy certain privileges during the war. Nominally students who have attended nine semesters and who entered military service up to January 7, this year, are entitled to pass their last two examinations during the period from March 15 to May 15. After passing these examinations they will be graduated, and promoted to the rank of medical doctor. The military authorities allow eight weeks' leave for this purpose on the production of a certificate signed by the dean, who gives this certificate to every one who can prove that he has finished nine semesters. In time of peace, every student must attend ten semesters, after which he is entitled to pass the two final examinations. If he has passed them successfully, he is given his degree, but receives his diploma only after spending one "practical year" in hospitals which are on the list of the university.

WAR MEETING OF THE ROYAL SOCIETY OF HUNGARIAN OCULISTS

At the suggestion of Emil Gross, professor of ophthalmology at the Budapest University, the Hungarian oculists will meet on Whitsunday in the Budapest Ophthalmologic Clinic, and will discuss questions pertaining to the domain of ophthalmology connected directly with the war: trachoma, the visual capacity from the point of view of fitness for ser-

vice at the front, and field injuries of the eyes. The committee of the society requested the war and home defense ministers as well as the army authorities to send to this sitting active and reserve military doctors, allowing them five days' leave to enable them to travel to Budapest for this occasion. Of course, the request was complied with; even the chief of the German imperial field sanitary service promised to send many oculists and others interested in ophthalmology who could be spared.

ETHICS OF FAMILY PRACTICE DURING THE WAR

The Budapest Medical Association passed the following resolution: If a doctor attends a family whose physician is engaged in field service, or if a doctor occupies a position in a club or a hospital where his predecessor is in the field, he must regard himself only as a locum tenens. To endeavor to get positions held by men with the army is a violation of war medical ethics. Half the income accruing from locum tenens work is due to the original holder of the position; of course, expenses can be deducted in full. The association requested the public through the newspapers to reserve the position of family physician or reliance doctor (Vertrauensarzt) to the original doctor, now engaged in field service, and to pay the locum tenens the same amount as they paid to the former.

THE QUESTION OF POPULATION

Dr. G. Winter, in a paper before the medical society, said that, owing to diminution in the number of births because of the war, obstetricians and gynecologists will have to regard as their special duty to do everything in their power to work against depopulation. They can do this in part by curing patients of gonorrhea and syphilis, which induce sterility in women, and in part by making propaganda against wilfully induced childlessness. The second task consists in maintaining the fetus during pregnancy, particularly in preventing spontaneous, artificial and criminal abortion. The third task is to protect the child at birth, by increasing the number of properly educated midwives, who take special care in preserving the child's life during labor, and immediately call the doctor if necessary. Our aim should not be to save mother or child, but to keep alive both mother and child. Finally, the mother should be taught how to live rationally while nursing the baby, and how to nourish children properly.

Epilepsy—A Cause for Divorce

According to a decision of the Royal Hungarian Curia, the highest court of justice, epilepsy interferes with the purpose and natural course of marriage. Therefore the person suffering from epilepsy should make known his condition to the other person before marriage. If he neglects doing so, then the other party is entitled to ask for divorce, and the court will separate all couples when application is made on this ground. Of course, it is necessary to prove that the person suffering from epilepsy knew about his illness before marriage.

The Number of Students in the Budapest University

In the second semester of 1915-1916, the Budapest Royal Scientific University had 3,067 students; in the same semester of 1913-1914 there were 7,513. The number of medical students amounted to 1,059 (in 1914, 2,994). The increase of the number of women students is noteworthy; in the present half year there are 739 enrolled, among them 266 medical students. In 1914 there were 564 female students, with 175 medical students.

Honor to Eiselsberg

Francis Joseph has conferred on Prof. Dr. Anton von Eiselsberg, knight, adviser to the court, and admiral surgeon major, the rank of Order of Leopold Cross with the war decoration. This is one of the highest orders with which a medical man can be decorated.

Vienna Housing Conference

February 7 and 8, the meetings of the conference on dwelling hygiene were held in Vienna. The conference passed a resolution to present a memorandum to the minister of public hygiene to introduce regular control of dwellings. For the time being this should be in the hands of the medical officers of the municipalities, but after the termination of the war, special committees should be formed to this purpose. Two inspections a year are planned, and will be restricted to town and city dwellings. The chief task of the controller will be to discover sanitary defects and to force house owners to repair them. If they do not do so, the medical officers will be empowered to have the repairs made at the expense of the house owner.

Deaths

Heber Wheat Jones, M.D., Memphis, Tenn.; University of Virginia, Charlottesville, 1869; aged 67; a Fellow of the American Medical Association; dean emeritus and professor of clinical medicine in the University of Tennessee, Memphis, and the College of Physicians and Surgeons, Memphis; for ten years president of the Tennessee State Board of Health and State Board of Medical Examiners and for eight years president of the Board of Health of Memphis; surgeon in the Tennessee National Guard with the rank of colonel; who was presented with a silver service by citizens of Memphis in 1898, and in 1905 was given a check for $10,000 by the city for his services against yellow fever; one of the most noted sanitarians of the South; died at his home, June 26. At a special meeting of the Memphis and Shelby County Medical Society, resolutions of esteem and affection were adopted and members of the society were named as pallbearers for the funeral.

William Evans Casselberry, M.D., Chicago; University of Pennsylvania, Philadelphia, 1879; aged 57; a Fellow of the American Medical Association; formerly president of the American Laryngological Association and Chicago Laryngological Association; a member of the National Association for the Study and Prevention of Tuberculosis, American Climatological Association and Physicians' Club of Chicago and a fellow of the American College of Surgeons; one of the most prominent laryngologists of the United States; professor of therapeutics in Northwestern University Medical School from 1883 to 1894 and professor and emeritus professor of laryngology and rhinology since 1894; attending laryngologist and rhinologist to St. Luke's Hospital; died at his summer home in Lake Forest, July 11, from angina pectoris.

Julius Hayden Woodward, M.D., New York City; College of Physicians and Surgeons in the City of New York, 1882; University of Vermont, Burlington, 1882; aged 58; a Fellow of the American Medical Association; professor of diseases of the eye in the New York Post-Graduate Medical School and president of the Faculty Association of the institution; a member of the American Academy of Ophthalmology and Oto-Laryngology, American Laryngological, Rhinological and Otological Society, and American Otological Society; formerly professor of materia medica in the University of Vermont; died at his home, July 2.

Walter Gellhorn, M.D., Seattle, Wash.; University of Munich, Germany, 1904; aged 39; a Fellow of the American Medical Association; who was arrested at Kirkwall, Scotland, Dec. 9, 1915, while on his way to join the German Red Cross on the charge of having in his possession military plans and chemical formulas for the use of the German army, and had been held in Edinburgh Castle since that time, is reported to have committed suicide in the military prison at Edinburgh Castle, June 11.

David Ottawa Hancock, M.D., Henderson, Ky.; Kentucky School of Medicine, Louisville, 1891; aged 54; formerly a Fellow of the American Medical Association; a member of the Kentucky State Medical Association and its president in 1912; president of the Henderson City Board of Health and of the Henderson County Medical Association in 1906; died at his home, April 19, from nephritis.

Arthur T. Bodle, M.D., Bellaire, Mich.; Chicago Homeopathic Medical College, 1893; Hahnemann Medical College, Chicago, 1905; aged 57; a member of the Michigan State Medical Society; for twenty years physician to the Antrim County Home; member of the Kearney Board of Health; died from heart disease, June 1, while making a professional call.

Charles Frederick Nolen, M.D., Baltimore; University of Maryland, Baltimore, 1890; aged 47; a Fellow of the American Medical Association; well known as a specialist on diseases of the eye, ear and throat; ophthalmic surgeon to the Baltimore and Ohio System and assistant surgeon to the Presbyterian Eye and Ear Hospital, Baltimore; died, June 30.

Archibald M. Glass, M.D., Booneville, Ky.; University of Louisville, Ky., 1885; aged 53; a Fellow of the American Medical Association; secretary of the Owsley County (Ky.) Medical Society in 1915, and secretary of the Owsley County Board of Health; died at his home, June 21, from sarcoma of the throat.

Franklin Judson Cressy, M.D., Granite Falls, Minn.; College of Physicians and Surgeons, Keokuk, Iowa, 1877; aged

67; formerly a Fellow of the American Medical Association; a member of the Minnesota State Medical Association; died in St. Luke's Hospital, St. Paul, June 26.

Robert J. Gilliland, M.D., Easley, S. C.; University of Maryland, Baltimore, 1883; aged 55; formerly a Fellow of the American Medical Association; a member of the South Carolina Medical Association; died at his home, June 25, from cerebral hemorrhage.

Floyd Vernon Brooks, M.D., Washington, D. C.; Jefferson Medical College, 1877; aged 60; a member of the Medical Society of the District of Columbia; chief surgeon of the Chesapeake Beach Railroad and Washington Traffic Club; died at his home, June 25.

Frederick Buell Willard, M.D., Hartford, Conn.; University of Vermont, Burlington, 1900; aged 42; a Fellow of the American Medical Association and of the American College of Surgeons; died at his home, June 16, from peritonitis following appendicitis.

Louis Edward Niles, M.D., Springfield, Ohio; Dartmouth Medical School, Hanover, N. H., 1884; aged 54; a member of the Ohio State Medical Association and president of the Clark County Medical Society; died at his home, June 24, from pneumonia.

Reece Kelso Watkins, M.D., Spring City, Tenn.; University of Nashville, Tenn., 1871; aged 67; a member of the Tennessee State Medical Association; for more than thirty-five years a practitioner of Spring City; died at his home, June 25.

Amos W. Patterson, M.D., Indianapolis; Medical College of Ohio, Cincinnati, 1866; aged 76; formerly a Fellow of the American Medical Association; medical inspector of recruits during the Civil War; died at his home, June 26, from heart disease.

George Chambers, M.D., Saskatoon, Sask.; Eclectic Medical Institute, Cincinnati, 1896; for more than forty years a practitioner of Columbia, Mo.; and for the last two years a resident of Canada; died at his home, June 19, from senile debility.

Robert A. Hilton, M.D., Eldorado, Ark.; Louisville (Ky.) Medical College, 1894; aged 47; formerly a Fellow of the American Medical Association; a member of the Arkansas Medical Society; died in a hospital in Little Rock, June 24.

Mary Ann Chamberlin, M.D., Santa Cruz, Calif.; Homeopathic Medical College of Missouri, St. Louis, 1875; for sixty-four years a resident of the Pacific Coast and for the last thirty years of Santa Cruz; died at her home, June 26.

James Moore Donnelly, M.D., Troy, N. Y.; College of Physicians and Surgeons in the City of New York, 1876; aged 68; for nearly thirty years a practitioner and druggist of Troy; died at his home in North Troy, June 25.

Samuel David Booth, M.D., Oxford, N. C.; Medical College of Virginia, Richmond, 1867; aged 75; a member of the Medical Society of Virginia; a Confederate veteran; died at the home of his nephew in Oxford, June 28.

William Blundell, M.D., Paterson, N. J.; College of Physicians and Surgeons in the City of New York, 1861; aged 80; a member of the Medical Society of New Jersey; died at his summer home in Allensdale, N. J., June 30.

Nathaniel Alexander Orr, M.D., Belmont, N. C.; University College of Medicine, Richmond, 1904; aged 39; a Fellow of the American Medical Association; died at his home, June 21.

Milton H. Collins, M.D., South Charleston, Ohio; Medical College of Ohio, Cincinnati, 1881; aged 62; a member of the City Council of South Charleston for several years; died at his home, June 22.

Andrew M. Purinton, M.D., Kenduskeag, Me.; Dartmouth Medical School, Hanover, N. H., 1862; aged 78; superintendent of schools of Levant, Me., for twenty years; died at his home June 20.

David Thompson Cleland, M.D., Harlansburg, R. D. Newcastle, Pa.; Miami Medical College, Cincinnati, 1877; aged 64; died at his home, June 20, from pulmonary abscess following pneumonia.

Frank W. Wells, M.D., Owingsville, Ky.; University of Louisville, Ky., 1869; aged 68; died at his home near Owingsville, about June 20, from tuberculosis of the larynx.

Thomas S. Young, M.D., Partlow, Va.; Jefferson Medical College, 1852; aged 86; said to have been the oldest practitioner of Spottsylvania County; died at his home, June 18.

John S. Neely, M.D., Franklin, Ky.; University of Louisville, Ky., 1872; one of the oldest practitioners of Simpson County, Ky.; died at his home, June 19, from senile debility.

John Tyler Sweeny, M.D., Louisville, Ky.; Hospital College of Medicine, Louisville, 1906; aged 36; died at the home of his mother in Louisville, June 16, from tuberculosis.

James A. Conrad, M.D., Cleveland; Homeopathic Medical College of Missouri, St. Louis, 1877; aged 70; died at his home, June 7, from cerebral hemorrhage.

Grafton W. Gardner, M.D., Atlanta, Ga.; Ogletlorpe Medical College, Savannah, Ga., 1861; aged 86; died at his home, June 19.

Coursin G. Oyler, M.D., Merwin, Pa.; Ohio Medical University, Columbus, 1893; aged 51; died at his home, June 19.

Walter Jay Bell, M.D., Atlanta, Ga.; Tulane University, New Orleans, 1891; aged 47; died at his home, June 17.

Marriages

CHARLES FREDERICK MAHONEY, M.D., Winthrop, Mass., to Miss Agnes R. Driscoll of East Boston, Mass., at South Boston, Mass., June 28.

WALTER IRWIN HUME, M.D., Louisville, Ky., to Miss Beulah Lee Thompson of Mackville, Ky., at Springfield, Ky., June 28.

CHARLES JOSEPH KICKHAM, M.D., Brookline, Mass., to Miss Mary Josephine Keating of Jamaica Plain, Boston, June 28.

DAVID PAUL WHITMORE, M.D., Rock Springs, Wyo., to Miss Eva Belle Barber of Spring Valley, Minn., June 28.

JAMES STRATTON CARPENTER, JR., M.D., Pottsville, Pa., to Miss Claire Beck Dechert of Schuylkill Haven, Pa., June 25.

HENRY WHITE BROUGHTON, M.D., Jamaica Plain, Boston, to Miss Mary Lawrence Leavitt of Exeter, N. H., recently.

LIEUT. AUGUSTUS B. JONES, M. C., U. S. Army, to Miss Ethel Treen Jones, at Jefferson Barracks, Mo., June 28.

ALFRED HERMAN C. CARTHAUS, M.D., Thiensville, Wis., to Miss Jennie Kaestner of Plymouth, Wis., June 22.

FRANK WALKER YOUNG, M.D., Hartford, Ala., to Miss Ida Berryman Bilbro, at Clanton, Ala., May 31.

JOSEPH ENGEL, M.D., Brooklyn, to Miss Adele R. Rubenstein of New York City, June 25.

THOMAS MORRELL ARMSTRONG, M.D., to Miss Helen F. Kennedy, both of Philadelphia, June 28.

RALPH E. ROBINSON, M.D., Belmont, N. Y., to Miss Mabel Gibbons of Wyoming, N. Y., June 29.

WALTER MITCHELL ATKINSON, M.D., to Miss Pearl Zell, both of Brockwayville, Pa., April 12.

JOHN OTIS CLETCHER, M.D., Anthony, Kan., to Miss Mary M. Putnam of Penfield, Ill., June 23.

HERBERT SCOTT PATTEE, M.D., to Miss Barbara Sutcliffe, both of Manchester, N. H., June 22.

LUDWIG FRANCIS LUBELEY, M.D., Ryegate, Mont., to Miss Marjorie Brislin of Butte, June 21.

ROBERT FOSTER FENNELL, M.D., to Miss Margarette Street, both of Guntersville, Ala., June 24.

THOMAS ARTHUR PETTEPIECE, M.D., Freeport, Ill., to Miss Wilma Pierce of Chicago, June 23.

JESSE JAMES BEATTY, M.D., Farragut, Iowa, to Miss Pearl Snyder of Trenton, Mo., June 21.

JOHN ROBERT WRIGHT, M.D., to Miss Maycie Worthington, both of Knoxville, Iowa, June 3.

MARTIN C. GAUGHAN, M.D., to Miss Margaret V. Conway, both of Pittston, Pa., June 12.

BURT HORACE HARDINGER, M.D., Gays, Ill., to Miss Elsie Warder of Chicago, recently.

HARRY CAESAR SOLOMON, M.D., Los Angeles, to Miss Maida Herman of Boston, June 26.

HAROLD WILLIAM NIMAL, M.D., to Mrs. Goldie Fogler, both of Indianapolis, June 23.

MILES MARTIN, M.D., to Mrs. Annie Paul MacNair, both of Boston, June 29.

SILAS C. BLAISDELL, M. D., to Miss Mary E. Rose, both of Brooklyn, July 1.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

WINE OF CARDUI SUIT

(*Continued from page 142*)

May 19, 1916, Morning

TESTIMONY OF DR. EFFIE L. LOBDELL (CONTINUED)

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Dr. Lobdell stated that she had used viburnum prunifolium in her practice for nearly twenty-six years. She used Hayden's Viburnum Compound and also the dried extract in capsules. She gives either the dried extract in capsules or the fluidextract of viburnum prunifolium or combinations with various pharmaceutic preparations. She sometimes uses the solid extract for the convenience of the patient. She sometimes combines it with gelsemium and helonin and sometimes quinin. She practically always gives the viburnum prunifolium in combination.

Q.—Now I suppose that in your earlier practice you did use, as you say, Hayden's Viburnum Compound? *A.*—Yes, sir, I did.

Q.—Do you know what that is, doctor? *A.*—Well, in what way?

Q.—That is, what it contains? *A.*—Well, valerian, some valerian, and the viburnum, and the alcohol. It was for those effects I gave it.

Q.—What kind of viburnum does it contain, do you know? *A.*—Prunifolium, viburnum prunifolium.

Q.—Are you quite sure that Hayden's Compound contains any viburnum prunifolium? *A.*—Well, or the opulus, which is very much the same.

Q.—That is a different proposition. Do you know what it does contain? *A.*—I do not remember definitely now. I have not used it for about eight or ten years.

Q.—You have not used it for eight or ten years? *A.*—No, no, not since the pharmaceutical houses began making more accurate preparations; of course I have used those.

Q.—You did not consider that a very active preparation then? *A.*—No, sir, it was like all our preparations until the pharmaceutical houses perfected them.

Q.—What Hayden's Viburnum Compound contained, whether it contained viburnum prunifolium or not, you do not know, do you? *A.*—Well, I know that it contained prunifolium, but I know the family and I know the kind of drug. I know them in a general botanical way as well.

Q.—Well, but what kind of viburnum did it contain, doctor? Do you know what kind it contained, whether it had any viburnum prunifolium in it or whether it had simply viburnum opulus or not? *A.*—It was supposed to have viburnum prunifolium, because—

Q.—How is that? *A.*—It was supposed to have viburnum prunifolium in it.

Q.—I am not asking what it was supposed to have. I am asking whether or not you know. *A.*—Well, at that time the formulas were not given essentially to the public as they are under the Pure Food Act.

Q.—Well, you do not know then whether it had any viburnum prunifolium or not, do you, any viburnum prunifolium in it? *A.*—No, but I do remember that it was taught that it was viburnum prunifolium. I remember teaching it.

Q.—You remember that people supposed it had viburnum prunifolium in it? *A.*—Yes, sir, it was so taught.

Q.—How is that? *A.*—It was so taught.

Q.—Where? *A.*—At the College of Medicine, in the pharmaceutical department. I remember that very well.

Q.—Well, was the formula known in your day when you were in college, where it was taught? *A.*—I beg your pardon?

Q.—When was it that it was so taught? *A.*—It was taught in 1891 and before that when I was attending school, because I remember it was in our dispensary and I dispensed it as assistant.

Q.—It was a secret formula, doctor, was it not? *A.*—I beg your pardon?

Q.—It was a secret formula, was it not? *A.*—Well, I know, but then we were taught in a general way what they contained.

Q.—I understand, but I say it was a secret formula, was it not? *A.*—At that time it was not published.

Q.—Well, is it published now? *A.*—I do not know. I have not paid any attention to it in the last ten years.

Q.—All you know about whether or not there was any viburnum prunifolium in it is the reputation? *A.*—Yes, sir.

Q.—In connection with your use of Hayden's Viburnum Compound of viburnum prunifolium, is your experience based upon your use of it, that is, your opinion? *A.*—Yes, sir.

Q.—Entirely? *A.*—Yes, sir, in conjunction with my teaching.

Q.—What did they—what did your teaching show you? *A.*—That it was a correct thing to use and belonged to the class of antispasmodics proper for women.

Q.—And the experience which you have had in your practice has borne that out, has it? *A.*—Yes, sir.

Q.—So that the opinion which you have given as to the value of viburnum prunifolium is based upon your experience? *A.*—Yes, sir; and the best of my intention in its use.

Q.—And you say that you have never used it alone, but have always combined it with other drugs like quinin and gelsemium and drugs of that character? *A.*—Except as I have used those preparations merely dissolved in water, but of course they are the combinations.

Q.—They are the combinations? *A.*—Yes, sir.

Q.—Now do you know, doctor, what the recognized dose of viburnum prunifolium is, of the fluidextract of viburnum prunifolium? *A.*—It would be from probably fifteen drops to a teaspoonful.

Q.—From 15 drops to a teaspoonful? *A.*—Yes, sir, well diluted.

Q.—In other words, it is from 15 to 60 drops? *A.*—Yes, sir, well diluted.

Q.—And if a teaspoonful is 60 drops it would be from 15 drops to 60 drops? *A.*—Yes, sir.

Q.—Now, don't you know that the official dose of viburnum prunifolium, the fluidextract of virburnum prunifolium, is from 30 to 60 drops?

Mr. Walker:—That is objected to. I don't know that there is any official dose. What is the official dose? Everybody gives a different dose here. We have had all kinds of doses.

THE COURT:—Find out first whether there is an official dose.

Mr. T. J. Scofield: Q.—Is there any such thing known as an official dose? *A.*—An official dose is merely the average dosage which is put on the bottle for the convenience of reference.

Q.—How about your pharmacopeias? Do they give any doses which are considered official? *A.*—I consider that their dosage is merely a suggestion and not a rule.

Q.—Well, you know then what the pharmacopeia gives, do you, as the dosage? *A.*—Yes, sir.

Q.—What is the dosage?

Mr. Walker:—That is objected to.

A.—I do not know accurately.

Mr. Walker:—The pharmacopeia will show what it is.

The Witness:—What pharmacopeia do you mean?

Mr. T. J. Scofield: Q.—Well, the United States.

Mr. Walker:—That is objected to.

THE COURT:—The book will show.

Mr. T. J. Scofield:—I suppose it will.

The Witness:—That is empirical.

Mr. T. J. Scofield:—If she knows what an official dose is—

The Witness:—It is not necessary to know the official dose. You always have your reason for giving it, and your indications for how much to give.

Q.—How, then, do you determine what the dose will be? *A.*—On the age of the patient and on the condition which you are going to relieve, whether it is an acute condition, or a chronic condition, whether you want to have an immediate effect and a tonic effect.

Q.—So that the question in determining the dosage, the question of the age of the patient, and the effect which you wish to obtain, cuts a figure in the dosage? *A.*—Absolutely. We have a rule for it.

Q.—And also the condition of the patient that you expect to reach by the medicine? *A.*—Yes, sir.

Q.—So that you would not use as much with children as you would probably with adults or grown people? *A.*—Naturally.

Q.—And with young girls you would not use so much of it as you would with married women, probably? *A.*—It depends on the acuteness of the condition.

Q.—It depends altogether on the condition? *A.*—Yes, sir.

Q.—So that in one condition which you might find a patient to be in, you would give a larger dose of it— *A.*—Yes, sir.

Q.—Than you would in others? *A.*—Yes, sir.

Q.—And that dose would range all the way from 15 drops to 60 drops? *A.*—I would try to give the largest dose first, and then taper it down.

Q.—How about the question of the trouble being acute or chronic? Would that make any difference? *A.*—Yes, sir.

Q.—Tell us about that, doctor? *A.*—Well, in an acute case where you would want an immediate result, why you would give a much larger dose first, and then discontinue as you got your physiological action. If you wanted it for a chronic condition, you would try to get an average dose which would continuously—give you a continuous effect.

Q.—Then, if I understand you, in the first case which you cited, or in acute cases, you would vary the dose from day to day, and time to time, in accordance with the condition? *A.*—The directions would so order.

Q.—And you would give the largest dose first? *A.*—Yes, sir.

Q.—And then taper it down as you observed the effect of the medicine, and the condition of the patient. Is that right? *A.*—Yes, sir, I would lengthen the interval of the giving of it, or the amount, either one.

Q.—Then you would depend upon the condition of the patient—depending upon that whether or not you would lengthen the time between your doses which are given? *A.*—Yes, sir.

Q.—And you would also change and vary the size of the dose? *A.*—Yes, sir.

Q.—Why would you do that? *A.*—Because we know about, in a relative way, how much physiologically the individual will need. We try to correlate our knowledge of what we are giving with what the human body can take care of.

Q.—Then, if I understand you right, doctor, you do not think that any medicine like viburnum prunifolium should be given in the same doses under varying conditions, without any change, to young girls and married women, and women in after life, through the menopause? *A.*—If an average dose was given, it would be harmless.

Q.—Do you think that it would produce results? *A.*—Yes, sir, it would produce the result, yes, but it would not produce harmful results because that is more or less limited.

Q.—Do you think that that would be good treatment, doctor, as you have described what constitutes good treatment? *A.*—If your patient—yes, I think it would not be bad treatment, at least it is better than doing nothing.

Q.—In all cases? *A.*—Well, I think we are just considering the average case.

Q.—What do you mean by the average case? *A.*—Well, the majority of cases which are symptomatic and not organic.

Q.—The majority that are symptomatic and not— *A.*—Organic.

Q.—And not organic? *A.*—Yes, merely functional.

Q.—In your experience, in your practice, do you find many cases where you would want to simply give an average dose in that way running along through the sickness, or would you want to treat it as you have described? *A.*—In that class of cases because they are what are called ambulatory cases, they merely come to the office, and go back and forth and report. They are not bed cases. They practically do as they please anyway.

Q.—Were you through, doctor? *A.*—Yes, sir.

Q.—What would you call an average dose of the fluidextract of viburnum prunifolium, as you give it? *A.*—Why, from five to ten grains would have no deleterious effect.

Q.—I am speaking of the fluidextract, doctor? *A.*—Oh, the fluidextract?

Q.—Yes? *A.*—Oh, I should say the equivalent of 15 or 30 drops would be an average dose, would be one that could be continued indefinitely.

Dr. Lobdell stated that 15 per cent. of the diseases of the pelvic organs require surgical treatment; that she gives surgical treatment if the patient needs it. She never determines on operation under a month or six weeks, during which time the patient is under observation and examination. She considers such an examination necessary. She examines the patient from one to two or three times a week, before determining the character of the treatment and this is necessary and the patient has a right to expect it. The patient would not know whether or not she needed an operation. Dr. Lobdell stated that usually the patient knew that she had something wrong but an examination of the secretions is necessary to determine the exact difficulty. Dr. Lobdell stated that these germ conditions are easily communicated. The witness stated that nephritis is a complication of pregnancy which she treats. When a patient comes in, she determines whether the patient is pregnant. She then examines the urine and the vaginal tract to see if there are any obstructions or any discharges or any malformations. She considers the examination of the urine an important routine measure.

Q.—And in that way you determine whether there is any albuminuria there, I suppose? *A.*—Well, that is not important.

Q.—You say that is not important? *A.*—No, sir, that is not specially important. We—we determine it and watch it, but that of itself is not important.

Q.—What do you say? *A.*—We determine it and watch it, but that of itself is not important—is not specially important.

Q.—Well, what is albuminuria? *A.*—It is merely a symptom—it is the presence of the albumin in the urine, and it may be due to a number of things, you know.

Q.—Yes. Well, I am not referring to the mere fact that there may be evidence of albuminuria, which you say is merely a symptom, but isn't the rest of it important to a woman that is pregnant? *A.*—Well, we have to first ascertain where it is caused. It may be merely in the bladder, due to the presence of pus cells in the bladder; and we get a certain per cent. in that; and we have to eliminate the bladder albumin. That is a little different than the other. Then the kidney albumin may be transitory. We have to watch to see if it is peculiar to that patient. Some patients have albumin just ordinarily, and it does not make much difference.

Q.—Do you give any treatment for it when it is a kidney condition? *A.*—I give them general treatment, or a special treatment, a treatment based on the general condition of the patient. I pay no attention to the albumin itself, except by hygiene and general treatment.

Q.—How often do you go through that process of making an examination of the urine? *A.*—Till I have determined—sometimes every day for a week—sometimes the entire quantity that is eliminated in any given 24 hours, and then after that at frequent intervals till I determine—after that I just control it.

Q.—Suppose your patient's feet commenced to swell and she becomes drowsy and has a good deal of headache; what do you do? *A.*—Diet her, put her on baths and rest.

Q.—What is that for? *A.*—Elimination through the skin.

Q.—You recognize the fact that the kidneys are not eliminating sufficiently, do you? *A.*—If she has—

Q.—I say, you recognize the fact— *A.*—Yes, sir.

Q.—that the kidneys are not doing their duty— *A.*—Yes, sir.

Q.—their full duty to the patient? *A.*—Yes, sir, that they are not equal to their burden.

Q.—Now, do they have any inflammation of the retina as a result of that condition? *A.*—Oh, yes.

Q.—You determine that by such an examination? *A.*—No, sir—after an ophthalmoscopic examination.

Q.—Well, by some examination by some one? *A.*—Yes.

Q.—Don't you look on that as a serious condition, and a dangerous condition? *A.*—Well, serious, but not necessarily dangerous.

Q.—Do you recognize that convulsions are liable to occur? *A.*—Yes, sir, but if you are ready for them, they are not so dangerous as they used to be.

Q.—Don't you think it would be a better thing, doctor, to prevent them, if you can do it, rather than try to be ready for them if they come? *A.*—Yes, sir.

Q.—And the necessity of treatment of some kind for that condition comes by reason of your examination— *A.*—Yes, sir.

Q.—from time to time, during pregnancy? *A.*—Yes, sir, you are responsible for that patient's condition.

Q.—Now, in those cases, what kind of a diet do you give? *A.*—Oatmeal and milk—a very simple diet, with eliminants and anything that will—things that would keep the skin active and keep them eliminating freely.

Q.—You put them on what you might call a bland diet? *A.*—Yes, sir—

Q.—One that is not stimulating? *A.*—Sometimes stimulating, sometimes we have to have stimulating—depending on what condition arises.

Q.—Well, it is not a stimulating diet? You do not give any stimulating diet? *A.*—Well, I give champagne sometimes, and things of that sort, in those cases.

Q.—Is it not true that, as a rule, where you find patients with nephritis, you rather put them on a thin milk diet? *A.*—No, not necessarily.

Q.—Well, you do it often, don't you? *A.*—Nothing that will deplete the strength or the tonic condition of the patient. We have to be very careful to avoid that. She must have enough muscle tone for her labor.

Q.—Doctor, don't you know, or is it not true, that in practically all those cases which are referable to kidney conditions which manifest themselves throughout pregnancy—kidney inflammations, that you tell your patients to cut out all stimulating matters? *A.*—Well, albuminuria is not necessarily an inflammation of the kidney.

Q.—I am talking about kidney inflammations. I have passed from the albuminuria. *A.*—I beg your pardon.

Q.—Don't you tell them to cut out all stimulating foods and drink? *Mr. Walker:*—When?

The Witness:—I don't recognize—in the inflammation of the kidneys that I know of, they are all infections of the kidneys. I know of no inflammation of the kidney not an infection.

Mr. T. J. Scofield: Q.—How is that, doctor? *A.*—I know of no inflammation of the kidney not an infection.

Q.—I say, whatever you may call it, I do not care whether you call it kidney trouble coming from infection or what—under those conditions, when women are pregnant, don't you have them cut out all stimulating food and drinks? *A.*—Why, the—unless they seem to me—if they seem to me to need anything stimulating, I don't entirely; depending so much on their habits, you know—I have so many patients in the foreign population, who are accustomed to those things, that I don't make a great difference between what they are accustomed to, and what they have enforced on them, you know.

Q.—Well, suppose they are not foreign people. You say you have a great many of them, and don't like to make too great a change in their diet or treatment. Suppose they are not in that class. Suppose they are people who have not been accustomed to the use of those things. Do you tell them to cut out stimulating food and drinks, or not? *A.*—I prescribe the diet for them that they shall have. I write out or give them definite details.

Q.—Won't you answer the question, doctor? Do you tell them to eliminate stimulants, both in food or drink, or do you not? *A.*—I cut out tea and coffee and things of that sort, and put them on milk diet and on bland foods.

Q.—Do you tell them to go ahead and drink champagne and beer? *A.*—No, sir, not beer; but I let them have the light wines.

Q.—Do you know what the amount of alcohol contained in light wine is— *A.*—Oh, yes.

Q.—as compared with the alcohol contained in beer? *A.*—Of course it is very much less, but it is a different kind. The combinations in the fruit wines are not contraindicated, I think.

Q.—You don't mean to say—you say "contraindicated"? *A.*—Yes, contraindicated.

Mr. T. J. Scofield: Q.—Well, is there any difference in ethyl alcohol— *A.*—Oh, yes.

Q.—Whether it is from fruit or corn? *A.*—Oh, yes; I think there is.

Q.—What is the difference? *A.*—Well, in the fruit alcohols, it would be by their own fermentation—

Q.—I am asking you about ethyl alcohol? *A.*—Well, the ethyl alcohol I am only familiar with has—I have used it in—I know it is a very high per cent. of alcohol; whereas, the fruit alcohols run about seven to ten or twelve per cent.; even less.

Q.—Now, don't you know, doctor, that all alcohol that you get from any wine or beer, or in any other sort of liquors, is ethyl alcohol? *A.*—Probably is essentially, synthetically, but—

Q.—What is it? *A.*—It probably is essentially and synthetically, but it makes a great deal of difference as to how it acts, what you use it for.

Q.—Whether or not alcohol comes from grapes, or whether it comes from corn, makes a difference in its action? *A.*—Yes, because you only use just—you could drink quite a good deal of wine and get but very little, and there would be other things with the wine that would compensate—if you took the ethyl alcohol, you would just take a little bit for a specific purpose.

Q.—So far as the amount of alcohol that the wine contains is concerned, you get the same effect, do you not, from that alcohol, that you get from the same amount of alcohol in some other drink? *A.*—No, I think you get a better effect.

Q.—Why is that? *A.*—Well, you would get the addition of the other ingredients with it.

Q.—Doctor, I am not referring to that. I am speaking of the alcohol effect, so far as the alcohol itself produces an effect, be that great or small. The alcohol effect is the same from one kind of alcohol or another, is it not—ethyl alcohol? *A.*—It probably would be. They are exactly the same thing.

Q.—And I suppose the dilution, the manner in which it is conveyed to the stomach, or the dilution, the only effect is the local effect—isn't that true? *A.*—That would probably be true.

Q.—If it is much diluted, why, it does not affect the stomach, does it, so much? *A.*—It is more quickly eliminated.

Q.—Well, now, when the alcohol—no matter whether it is from wine or beer or whisky, or from Wine of Cardui, or how much it is diluted; when it is absorbed into the blood, the quantity being the same, the effect is the same, is it not—the alcohol effect? *A.*—It is not absorbed; it is oxidized, except for about a very small per cent.

Q.—Where is it oxidized? *A.*—Immediately it is taken into the circulation.

Q.—It is absorbed, is it not, before it is taken into the circulation, or it would never get there? *A.*—It is not absorbed as pure alcohol.

Q.—Why? *A.*—Because it is mixed with the fluids of the stomach, and whatever else may be in the stomach, and it is—it simply goes in as part of whatever else happens to be along with it.

Q.—You do not mean to say that the juices of the stomach will change the effect of alcohol, do you? *A.*—Oh, no, but it mixes with it, and—

Q.—Yes? *A.*—Yes, and—

Q.—But, so far as the alcohol is there, whatever the alcohol effect is, it is produced, is it not? *A.*—No, sir; because it would have either a local or a general effect, and a local effect, if it is well diluted, would be transitory. It would just go on very readily; whereas, if it is pure alcohol taken in, it would have a very irritating local effect.

Q.—Now, when it enters the circulation it enters as alcohol, doesn't it? *A.*—Yes, sir, it enters as alcohol.

Q.—What becomes of it then, doctor? *A.*—It becomes oxidized and eliminated through the kidneys and the skin.

Q.—Where is it oxidized?

A.—In the circulation.

Q.—What does it become? *A.*—It ends.

Q.—What is that? *A.*—It simply does not—it is a neutral that has no special, specific—

Q.—What is it broken up into, and what does it form? *A.*—It is not broken up into anything; it is synthetic in itself.

Q.—It is? *A.*—Yes, sir, as far as I know.

Q.—Is it not burnt up in the system? *A.*—Sir?

Q.—I say, is it not burnt up in the system? *A.*—Oh, there is a product of combustion, yes.

Q.—Is that what you mean by oxidization? *A.*—Yes, sir.

Q.—Now, what is formed by the oxidization of alcohol? *A.*—Carbon.

Q.—What do you say? *A.*—Carbon.

Q.—What kind? *A.*—Just carbon. I think that the chemical—I do not remember, but I think the chemical formula is CH—but I don't just remember.

Q.—When you say carbon, do you mean charcoal?

Mr. Walker:—I object to that.

The Witness:—No, that is different.

Mr. T. J. Scofield: *Q.*—You said carbon. What is it? *A.*—Energy and heat.

Q.—That is the result of the oxidization, is it not? *A.*—Yes, sir—

Mr. Walker:—I object to that. It is immaterial.

The Witness—that is the result.

The Court:—I think you have gone far enough in this.

Mr. T. J. Scofield:—Well, I want to find out about the alcohol and the way it goes.

The Court:—The witness has told you.

The Witness:—I am not an expert chemist.

The Court:—The witness has told you what she thought it was.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield: *Q.*—You say you are not an expert chemist?

The Witness:—No, sir.

The Court:—You were asking her what the ash is that is left.

The Witness:—There is no ash.

Mr. T. J. Scofield:—Let me ask just one other question which is not chemical, I think, your Honor.

Q.—Whatever the effect of the alcohol may be, and whatever becomes of it after it gets into the circulation, it exercises its alcoholic effect—*A.*—There is practically none left.

Q.—before it leaves the stomach; doesn't it? *A.*—Yes, sir; it is a diffusible stimulant.

Q.—It exercises its effect before it is oxidized, doesn't it? *A.*—Its immediate effect—

Q.—Yes, but I say— *A.*—that is on the nerves, not the—

Q.—Well, it exercises its alcoholic effect before it is oxidized, doesn't it? *A.*—Yes, sir, very rapidly.

Mr. T. J. Scofield:—Doctor, do you agree with the statement that gonorrhea is often—or that leukorrhea is often due to gonorrhea? *A.*—There is a leukorrhea which remains after gonorrhea has been treated.

Q.—Well, now, will you kindly answer the question, doctor?

Mr. Walker:—I submit that that is an answer.

The Court:—It is partially answered.

Mr. T. J. Scofield: *Q.*—Do you agree with the statement that leukorrhea is often due to gonorrhea? *A.*—Is often due?

Q.—Yes, often due? *A.*—Yes, I agree.

Q.—Well now, doctor, assuming that you have a case of leukorrhea, which is due to gonorrhea, would you recommend the use of such a medicine as Mr. Walker called your attention to on your direct examination, and expect that medicine to cure the disagreeable and disgusting affliction—

Mr. Walker:—That is objected to.

Mr. T. J. Scofield: *Q.*—And restore the female organs—

Mr. Walker:—Objected to.

Mr. T. J. Scofield:—Wait till I get through. You have so often asked me to do that.

Mr. Walker:—Pardon me, I thought you had finnished.

Mr. T. J. Scofield: *Q.*—And restore the female organs to health?

Mr. Walker:—Now I object to it.

The Court:—You may ask the witness her opinion, Mr. Scofield.

Mr. T. J. Scofield: *Q.*—Well, what would be your opinion, doctor? *A.*—Any medication would be merely part of the treatment.

Q.—I did not get your answer; it is difficult to hear here. *A.*—Any medication would be merely part of treatment for anything of that sort.

Q.—Well, I suppose, of course, you would tell her to keep her bowels open and give particular attention to diet; you would do that, wouldn't you? *A.*—Yes, sir, but—

Q.—You probably would tell her to take some douches, too, wouldn't you? *A.*—Yes, sir; those are matters of toilet.

Q.—Yes, those are matters of toilet. But now, can you answer the question—what do you say about that, doctor—in your opinion would the use of such a medicine as Mr. Walker has called your attention to, cure the disagreeable and disgusting affliction, and restore the female organs to health?

Mr. Walker:—Now, pardon me, but—

The Witness:—We never use the word "cure," I think.

Mr. T. J. Scofield: *Q.*—I am using it now. I say do you think it would cure, or wouldn't it? *A.*—It would not cure— ethically we do not use the word "cure," as I understand it.

Q.—I am not finding fault with you about how you use it ethically. I am quoting it from a book that Mr. Walker called attention to. Now, I am asking you what you would say as to the word "cure" in that connection, and as a part of the question which I have propounded? *A.*—As a physician I would say no.

Mr. Scofield then asked the witness her opinion of certain advice given in the Home Treatment Book for Women assuming that Wine of Cardui contains 48 drops of alcohol and the extractives from 30 grains of carduus benedictus and 3 grains of viburnum prunifolium. Objection was made to the question on the ground that the witness had stated that she did not know anything about carduus benedictus.

The question was then recast omitting the carduus benedictus and objection was made to this as it eliminated one of the contents of the medicine.

Mr. T. J. Scofield: *Q.*—Doctor, assume that a medicinal solution contains the extractives from 3 grains of viburnum prunifolium extracted in a 20 per cent. menstruum of alcohol, and that it contains also the extractives from 30 grains of another herb or thistle, and that the characteristic of the second herb or thistle is that of a simple bitter, with some slight hepatic action. I will ask you to state whether or not, in your opinion, that tablespoonful doses of that preparation, containing 48 drops of alcohol and such extractives as this question suggests, should be taken three or four times a day on the first approach or sign of the coming change of life and continued throughout the entire period?

Objection was made but overruled.

Mr. T. J. Scofield: *Q.*—What do you say, doctor, to that question? *A.*—Taken as it would naturally be, while the patient was also taking food, it would have practically no deleterious—no deleterious effect. I can see that it would have no deleterious effect.

Q.—I am not asking that doctor. I am asking you whether, in your opinion, such a medicinal solution should be given three or four times a day on the first appearance of the change of life, and if it should be continued throughout the entire term, as a regular routine, during the menopause?

Mr. Walker:—I object to it for the same reason.

The Court:—She may answer.

To which ruling of the Court the plaintiff, etc., excepted.

The Witness:—It is so indefinite it is impossible to answer.

Mr. T. J. Scofield: *Q.*—Very well. I will ask you then—what do you mean by "so indefinite it is impossible to answer"? *A.*—In the first place, a physician cannot conceive of the beginning of the change of life as being a definite thing any more than the ending of a change of life would be a definite thing. In fact, the women now-a-days don't have change of life; they don't fall into the habits of distress and invalidism that was formerly the rule.

Q.—That is your experience now, is it? *A.*—Yes, sir; we don't even call it that any more.

Q.—What do you call it now? *A.*—Making the turn, is the expression used.

Q.—Making the turn? *A.*—Yes.

Q.—All right. Now then, doctor, I am not asking you what physicians can conceive or what they cannot conceive, but whatever they call it, I don't care anything about that. I am asking you to assume

certain things; then I am asking whether or not, in your opinion, however they may ascertain when the change of life is approaching, or whatever they may call it; is it your opinion, as a physician and surgeon, that that solution should be given three or four times a day, every day, as a routine proposition, to every woman, throughout the change of life, the menopause, or the turn of life, as you call it? *A.*—I really cannot answer that. It is too much of a question.

Q.—Well, you can say whether you think it ought to be done, or whether you think it ought not, can't you? *A.*—I don't think it can be given an opinion.

Q.—What is that? *A.*—It could not be given an opinion, because an opinion would be purely a personal expression.

Q.—Well, that is what I am asking you. I am asking for a purely personal expression? *A.*—I don't wish to give it.

Q.—You don't wish to give it? *A.*—No, sir.

Q.—Why, doctor? *A.*—Because I have not any definite idea about it. I would hear somebody else doing it, and have an opinion; but just to give an opinion off-hand, I could not do it; I haven't an imagination for it.

Q.—And you are averse then, to going on record one way or the other? *A.*—I am averse to going on record.

Q.—One way or the other? Either way? *A.*—At all.

Q.—Now, doctor, if you had a case of a married woman who was suffering from sterility, and the sterility was due to some abnormal condition in the female pelvic tract; would you advise the use of such a medicinal solution as I last described to you— *A.*—That would depend on whether—

Q.—Wait a minute. —for it, without first learning the underlying cause of the sterility? *A.*—If the patient came to me, I would, of course, ascertain the cause.

Q.—What did you say? *A.*—If a patient came to me, I would ascertain the cause.

Q.—You would first ascertain the cause? *A.*—Yes, I would first have to have the patient.

Q.—And that would be ascertained by an examination of such a character as you might conduct? *A.*—Naturally.

Q.—Doctor, do you agree that sterility is sometimes due to such wasting, weakening diseases as consumption, malaria, diabetes and Bright's disease? *A.*—The vital organs are quite independent of the accessory organs, and therefore might not necessarily be affected.

Q.—Doctor, I am not asking whether it would necessarily be affected. I am just simply asking you—you say not necessarily; that means it may. Now, please answer the question. Do you agree with the statement that sterility is sometimes due to such wasting, weakening diseases as consumption, malaria, Bright's disease and diabetes? *A.*—It would be in a case of tuberculosis, because menstruation itself stops rather early in tuberculosis and—

Q.—Now, how about malaria? *A.*—I do not—we do not have much malaria here. I have never had much malaria.

Q.—You have not had much experience with it? *A.*—No, sir.

Q.—How about diabetes? *A.*—Well, diabetes during the childbearing age is fatal to that—but if the diabetes was a complication of the pregnancy I would not know much about it—I could not tell.

Q.—How about hookworm? *A.*—I have only seen one case of hookworm, and it did not interfere with her.

Q.—How about Bright's disease? *A.*—Well, it would depend on the stage of the Bright's disease entirely.

Q.—Well now, doctor, what I am going to ask you is—I am asking you if you think it sometimes is produced by any or all of these different conditions?

Mr. Walker:—I object to it on the ground it has already been answered and explained, as to each condition.

THE COURT:—She may answer.

Mr. Walker:—And also that it is immaterial.

THE COURT:—She may answer.

To which ruling of the Court the plaintiff, etc., excepted.

Mr. T. J. Scofield: *Q.*—Well, doctor, assume that in the Cardui—or in Home Treatment for Women, as copyrighted by the Chattanooga Medicine Company, and which is sent on application to women, on page 41, in the 1912 edition and in the 1913 edition, assume that it is stated there that sterility is sometimes due to such wasting, weakening diseases as consumption, malaria, diabetes and Bright's disease; have you an opinion—

Here plaintiff's counsel objected and, after some argument, were sustained.

Q.—Doctor, under the heading of "Sterility" in the Home Treatment for Women, to which I called your attention a few minutes ago, it is said, and referring to the question of the treatment of a condition of sterility—I read as follows: "Women suffering from wasting, weakening diseases, such as consumption, malaria, diabetes, Bright's disease, etc., are often barren." Do you agree with that statement, doctor? *A.*—Yes, sir.

Q.—Will you tell the jury your opinion of the value of such a solution as I have lastly called your attention to in effecting a cure of sterility when due to any one of the four causes mentioned in the preceding question?

This question was objected to but the witness was permitted to answer.

A.—If it would build up the general nutrition of the patient to a point where she would physiologically become pregnant, it would.

Mr. T. J. Scofield: *Q.*—Doctor, just a moment. Will you please answer the question first. I am not asking for your reasons.

Mr. Walker:—She did.

Mr. T. J. Scofield:—I am asking whether or not you have an opinion.

THE COURT:—Well, let the answer be that she has an opinion. Now, give the opinion, Doctor.

The Witness:—My opinion is if it built up the general nutrition of the patient so that she became physiologically naturally pregnant, it would.

Mr. T. J. Scofield:—I move to strike out the answer, if the Court please.

THE COURT:—It may stand.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield:—Have you an opinion as to whether or not that solution will do that thing, whether it will build up that system in all those diseases and conditions?

Mr. Walker:—I object to it.

THE COURT:—She may answer.

Mr. Walker:—What solution is he talking about, Judge?

THE COURT:—The very one the witness had in mind when she said if it effects certain things it will be of value.

The Witness:—The last question, please.

Mr. T. J. Scofield: *Q.*—The question is, do you think it would build them up if they had consumption, Bright's disease—

Mr. Walker:—That is not the question.

Mr. T. J. Scofield: *Q.*—(Continuing) —malaria or diabetes? *A.*—It might and it should.

Q.—You think it would? *A.*—It should, if it is supposed to be, what you say—

Q.—What did you say? *A.*—If it is a tonic, it should.

Q.—You think it would build them up, so that the consumptive effect, tubercular effect, would be overcome?

Mr. Walker:—That is not what she said.

The Witness:—It has been known to do it.

Mr. T. J. Scofield: *Q.*—What is that? *A.*—The tonics have been known to do it.

Q.—I am talking about this medicine, doctor. *A.*—That is, your medicine, that is that which you have in the hypothetical—

Q.—What was the medicine which I described? *A.*—The medicine containing several ingredients in alcohol solution.

Q.—What were they? *A.*—Just in the—I don't remember just now, but I am willing to—

Q.—Oh, you don't remember. Then I don't suppose you can answer the question. Now, doctor, you have testified to something here at puberty, and as to the use of medicines for girls? *A.*—Yes, sir.

Q.—You have said, haven't you, that 90 per cent. of all girls who pass through the period of puberty, from girlhood to womanhood, go through it with pain and suffering? *A.*—Yes, sir.

Q.—And then you mean, I suppose, to say by that that 10 per cent. do not? *A.*—Yes, sir, about 10 per cent. do not.

Q.—The 10 per cent. go through normally and naturally? *A.*—Yes, sir.

Q.—A physiological process, merely? *A.*—Yes, sir.

Q.—And the other 90 per cent. go through in sickness? *A.*—Well, now, we don't call it sickness.

Q.—Very well—with pain and suffering? *A.*—Yes, with discomfort.

Q.—Now, bearing in mind that it is purely a physiological process with 10 per cent. of the girls who go through it without these discomforts, what is your opinion as to whether every girl, including the ten per cent., should take the medicinal solution to which I called your attention a while ago, at the time of puberty, during the whole period of puberty? *A.*—Well, the period of puberty is about as indefinite as the period of the menopause.

Q.—Well, whatever it is, what is your notion about it, if the 10 per cent. that you say—with whom you say it is practically a physiological action, who go through it normally, naturally, without those discomforts that the other 90 per cent. have—what is your opinion as to whether such a medicine as I described to you in the question a while ago, should be taken by the 10 per cent. or by any of the 10 per cent. throughout all the period of puberty? *A.*—I don't conceive that it would be taken by any who did not need it.

Q.—Well, that does not answer the question. What is your opinion as to whether it should be given to them during the whole period of pregnancy—or puberty, I mean? *A.*—Naturally not.

Q.—You say not. Now, doctor, on the question of menorrhagia, it is said in the Ladies' Birthday Almanac of 1907, on page 23, that "Flooding is always a sign of danger." Do you agree with that? *A.*—Yes, sir.

Q.—"The best treatment is complete rest in bed." Do you believe in that? *A.*—Yes, sir.

Q.—"And Wine of Cardui three times a day." Assuming that Wine of Cardui is the solution, medicinal solution to which I have directed your attention in these inquiries which I have been making, do you believe that this is the best treatment in all cases of flooding, regardless of the cause which produced the flooding? *A.*—I am not testifying as to the Wine of Cardui as a medicine.

Q.—I am not asking that—

THE COUPT:—You may assume, Madam, that the Wine of Cardui is the medicine that Mr. Scofield called your attention to that you said would or would not have certain effects on certain diseases.

The Witness:—Any remedy of that kind might be tried at this time logically.

Mr. T. J. Scofield: *Q.*—Well now, that is not what I am asking you, doctor. I am asking you whether or not you believe that such a solution as that is the best treatment in all cases of flooding, regardless of the cause which produces the flooding? *A.*—I don't think a physician can answer that question.

Q.—You don't? *A.*—No, sir.

Q.—Who else could answer it? Do you think the Chattanooga Medicine Company with its advertising counsel could answer that question?

Mr. Walker:—That is objected to.

The Court:—Objection sustained.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield: Q.—Do you think that a layman, one who is not a physician and experienced in the practice, could answer it?

Mr. Walker:—That is objected to.

The Court:—Objection sustained.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield: Q.—Do you think then, that a lady who was reading an advertisement in an almanac—

The Court:—Let us not pursue that. It is not a proper question.

Mr. T. J. Scofield:—Very well, your Honor.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield: Q.—Who could answer such a question, doctor?

Mr. Walker:—Objected to.

The Court:—If she knows.

Mr. T. J. Scofield: Q.—If you know.

A.—The patient herself.

Q.—The patient herself? A.—Yes.

Q.—Could she tell what the underlying cause was of her trouble?

Mr. Walker:—That is objected to. He has been over that ground before.

The Court:—I think you have covered that.

Mr. T. J. Scofield:—Not with this, not on the question of menorrhagia, your Honor.

The Court:—Very well, go ahead.

Mr. T. J. Scofield: Q.—The question is addressed specifically to whether or not this medicinal solution is the best treatment in all cases of menorrhagia regardless of the cause that produces the menorrhagia. Do you think the patient could tell what the cause of the menorrhagia or flooding might be? A.—She would have an idea as to the cause, from her own experience, leading up to her illness.

Q.—I am asking whether she could tell the cause? A.—Sometimes, not definitely, but—

Q.—Sometimes? A.—Yes, sir.

Q.—In all cases? A.—No, sir, all are not informed—

Q.—What are the different things that produce menorrhagia or flooding, doctor? A.—It may be constitutional or local.

Q.—Well, what are the constitutional things? A.—The constitutional would be anything that depleted the character of the blood so that it did not coagulate properly or that the—well, syphilis is a frequent cause, and, of course, cancer is one of the very late causes.

Q.—What is the last thing you said there? A.—Cancer.

Q.—Cancer? A.—Yes, sir.

Q.—Now, I suppose, doctor, it is true that this flooding might be produced by any one of many kinds of inflammations, might it not? A.—Yes, sir.

Q.—It might be by endometritis, might it not? A.—Yes, sir.

Q.—By metritis? A.—Less so by metritis.

Q.—And by salpingitis? A.—Yes, salpingitis would produce it.

Q.—Ovaritis? A.—Yes, sir.

Q.—Pelvic cellulitis? A.—Yes, sir.

Q.—Pelvic peritonitis? A.—Yes, sir.

Q.—Inflammatory adhesions of the pelvis? A.—Yes, sir.

Q.—Fibroids? A.—Yes, sir.

Q.—Uterine polypi? A.—Yes.

Q.—And ovarian tumors? A.—Yes.

Q.—And uterine cancers? A.—Yes.

Q.—Displacements, both anteflexion and retroflexion—and anteversion and retroflexion? A.—To some extent, yes.

Q.—Inversion? A.—Yes, sir.

Q.—And uterine prolapse? A.—Yes, sir, in some.

Q.—And foreign materials that might be in the uterus? A.—Yes.

Q.—Enlarging and thickening of the mucous lining of the membranes? A.—Yes, sir.

Q.—And other foreign matters? A.—Yes, sir.

Q.—Following miscarriage, for instance? A.—Yes, sir.

Q.—It might be due to a retained placenta? A.—Yes.

Q.—It might be due to systemic disorders? A.—Yes, I think.

Q.—Hemophilia? A.—Yes.

Q.—Malaria? A.—Yes, sir.

Q.—Pellagra? A.—I am not familiar with pellagra.

Q.—Consumption? A.—Yes.

Q.—Uterine fibrosis? A.—I beg pardon?

Q.—Uterine fibrosis? A.—Yes, sir. It is usually associated with other forms of—

Q.—Arteriosclerosis of the vessels? A.—Yes—well, I think that is—

Mr. Walker:—I don't hear you.

Mr. Loesch:—I could not hear your answer.

The Witness:—So far as I know.

Mr. T. J. Scofield: Q.—And visceral disturbances?

Mr. Loesch:—What did you say about arteriosclerosis.

The Witness:—About that—well, that is not usually present until rather late in life, and you would not find it except in—

Mr. T. J. Scofield: Q.—Even though late in life, might it be due to that? A.—If it was at the menopause—

Q.—Yes. Now, visceral disturbances, it might be due to that, might it not— A.—Yes, sir.

Q.—Such as heart disease, liver disease, kidney disease? A.—Yes, sir.

Q.—Now then, how many cases of that kind do you think that such a medicinal solution as I have mentioned to you would constitute the best treatment, for the condition of flooding—without regard to which one of these causes may have produced it—any of them? A.—It would not be contraindicated.

Q.—I am not asking you whether it would not be contraindicated—water would not be contraindicated, would it? I am asking you whether or not now, having gone over the whole limit or line of these things that might produce that flooding, whether it is your opinion that such a medicinal solution as I have called your attention to is the best treatment in all of these cases of flooding, regardless of the cause which produced it? A.—No, sir.

REDIRECT EXAMINATION BY MR. WALKER

Q.—Are you regular—do you practice the regular school? A.—Yes, sir.

Q.—Now, you spoke in your direct examination about the length of time you would take in order to ascertain whether or not an operation was necessary? A.—Yes, sir.

Q.—What is the purpose of that? A.—To eliminate and exclude any other conditions than the one which I think is the cause.

Q.—State whether or not, doctor, in this modern day, at least in the last three or four years, there are less surgical cases than medical cases — I am not asking the proportion — but is the tendency of medicine to get away from surgery and to medicine?

Mr. T. J. Scofield:—What is that?

The Witness:—Yes, sir; conservation.

Mr. Walker: Q.—What was it you said about champagne; I did not understand it. You said something in answer to counsel on the other side, about champagne. I did not just hear what that was. A.—It is one of the most desirable forms of alcohol that we have to use, where we can use it, where the people can afford it.

Q.—Do you distinguish between alcohol as alcohol, and alcohol with drugs? A.—Yes, sir, I do.

Q.—What did you mean when you said about the drugs—the compensation of drugs when used with alcohol? A.—It would offset any disadvantages, and they were probably improved in their usefulness.

Q.—Now, doctor, is it a fact that women suffering from wasting, weakening diseases, such as consumption, malaria, diabetes or Bright's disease, are often barren? A.—Yes, sir.

Q.—Isn't it a fact they are often barren when they don't suffer from those diseases? A.—Yes, sir, it is not uncommon.

Q.—Take the medicine, the hypothetical medicine that Brother Scofield gave you, if you remember anything about it, with viburnum and this other stuff that had some effect, in 20 per cent. alcohol, his stuff—I don't remember what it was—and state whether or not it would hurt the other ten per cent. of girls at puberty, if they took it? A.—It would be negligible, in my opinion.

Mr. Walker:—That is all.

Whereupon an adjournment was taken until the same day, May 19, 1916, at 2 o'clock p. m.

May 19, 1916, Afternoon

TESTIMONY OF MR. JOHN F. BROWNELL

The court met pursuant to adjournment. Mr. John F. Brownell was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Brownell testified that he lives in Franklin Parish, Louisiana. He has known Dr. A. J. Reynolds of Fort Necessity, La., for about six years.

He has not talked with Dr. Reynolds about the testimony in this lawsuit. He had a conversation with Dr. Reynolds in West End Butcher shop in Winsboro, in December. The witness stated that Dr. Reynolds told him if he knew anybody who was using Wine of Cardui in place of whisky, he could get pretty good pay if he would come over here and swear to it.

The witness says he did not tell Dr. Reynolds that he had been selling Wine of Cardui and had to quit it and that his wife drank it all the time. Mr. Brownell is now a farmer. He quit merchandising in 1914. At that time he kept a store in Lydiaville about 8 miles from Fort Necessity. He sold Wine of Cardui in 1912. He bought three dozen bottles in 1912 and the last bottle was sold in 1913. Later he ran a store just below Lydiaville. He has not sold Cardui since 1914. The witness knows Mark B——. Mark B—— came to his store and asked for something to drink about a year and a half ago. Alsip M—— was with him. B——, according to the witness, took down a bottle of Blackberry and Ginger Tonic and took a swallow out of it. Mr. Brownell stated that there was not a bottle of Wine of Cardui in the store at that time. The witness identified a carton of blackberry and ginger tonic. The witness had three or four bot-

tles of this in his store. Mr. Fowler read the label on the bottle:

"Scott's Blackberry, and Ginger Tonic. 22 per cent. alcohol. For Diarrhea, dysentery, cramps in the bowels, colic and cholera morbis. Tablespoon every three or four hours. Price 75 cents a bottle."

Attorneys for the defendants waived the cross-examination.

May 22, 1916, Morning

TESTIMONY OF MR. DANIEL COIT CAMPBELL

Mr. Daniel Coit Campbell was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Daniel Coit Campbell testified that he resides in Chesterfield, six miles south of Ruby. He has known Dr. Robert M. Newsom for two or three years.

There was read to the witness the testimony of Dr. Newsom to the effect that the witness drank Wine of Cardui, that his horse ran away, that he lost his right ear, that he had a concussion, that he is paralyzed on his right side and that he is under treatment now. Mr. Campbell stated that he never drank Wine of Cardui. He had a runaway at a time when he was drinking. He bought Manola. The witness stated that his right ear was not cut off and exhibited it to the jury. He had suffered an injury on his right side. Dr. Newsom treated him. The witness does not even remember smelling Wine of Cardui.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness stated that on the day of the runaway he was mighty near drunk and had been drunk about all day. He drank corn whisky and Manola in the morning. Manola is a medicine. Chesterfield is in a dry state. The witness stated that he obtained the corn whisky from J. H., a mail carrier. He drank some with J. H. He testified that he was driving, went around a curve fast and was thrown out of the buggy and was unable to get up. The first thing he can remember was somebody sewing his ear—sewing it back on. Mr. Campbell testified that the corn whisky was given to him. It was yellow corn whisky, as far as he remembers.

TESTIMONY OF MR. W. G. WHITE

Mr. W. G. White was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. White testified that he resides in Chesterfield, S. C. He has been in the drug business for nearly four years. He knows Coit Campbell, the previous witness, and remembers the incident of the runaway. Mr. White testified that on that morning Mr. Campbell came in and bought a bottle of Manola, about an hour and a half before the accident.

Mr. White sells Wine of Cardui in his drug store. He has known Dr. Newsom for about five years, and testified that the general reputation of Dr. Newsom for truth and veracity is not good, and that he would not believe him under oath. The witness testified Campbell had bought Manola on previous occasions but had not bought Wine of Cardui.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Mr. White testified that there are three drug stores in Chesterfield. He has been working for the Chesterfield Drug Co. Previously he worked in Timmonsville, about fifty miles from Chesterfield. The witness graduated from the Charleston Medical College after two years' study in pharmacy. He testified that Manola is a tonic put up by the Manola Company in St. Louis, and that it contains 18 per cent. alcohol.

Q.—How long have you been selling Manola? *A.*—For several years.

Q.—That is a dry territory, isn't it? *A.*—Yes.

Q.—But you sell intoxicants in violation of the law nevertheless, do you? *A.*—No.

Q.—You do not? Are you allowed to sell that stuff? *A.*—Yes, sir.

Q.—Do you sell Wine of Cardui? *A.*—Yes.

Q.—Do all the drug stores there sell Wine of Cardui? *A.*—Yes.

The witness testified that on the morning of the runaway he saw Mr. Campbell. Mr. Campbell had been drinking. When Campbell bought the Manola the witness had an idea what he wanted to do with it. He did not drink it in the store but took it outside. The accident happened in Chesterfield about a block from the store and he went up to the scene of the accident. He remained there just a few minutes and went back to the store. He did not see Dr. Newsom at the accident. He did not look over Campbell as the crowd was so heavy around him. He saw Campbell later in the day at the hotel.

Q.—The fact that you had sold him this Manola, if that is what you call it, and that this accident occurred, did not give you any concern at all? *A.*—No. I had nothing to do with his drinking it at all.

Q.—How is that? *A.*—I had nothing to do with him drinking it at all.

The witness has known Dr. Newsom about five years. Dr. Newsom was in the senior medical class when the witness was in the senior pharmacy class. Dr. Newsom has a drug store of his own. The drug store is in Ruby, which is about six miles from Chesterfield.

The witness knows about thirty people in Ruby, which is a town of about 100. He does not know the reputation of Dr. Newsom in Ruby, where he resides, but he does know his reputation in Chesterfield. He stated that in Chesterfield there are three drug stores and in Ruby there is one. There are also general stores in Ruby. He does not recollect any general stores where they sell Wine of Cardui.

Q.—How many people have you heard say anything up at Chesterfield, about Dr. Newsom's reputation? *A.*—I do not know.

Q.—Well, about how many? *A.*—I don't know how many have said it.

Q.—Who did you ever hear say anything about it? *A.*—I have heard the doctors in the town.

Q.—Who? *A.*—Some of the doctors in the town.

Q.—What doctor? *A.*—Well, I don't have to say.

Q.—Well, you do have to say. I want to know who it is.

THE COURT:—Answer the question. *A.*—It was Perry.

Mr. T. J. Scofield:—What Perry? *A.*—W. J. Perry.

The witness also heard Dr. Glover of Chesterfield speak of Dr. Newsom. Mr. White came to Chicago following a visit to Chesterfield by Miss Ervin some time ago. He has been here two days. He was accompanied from Chesterfield by Mr. Levy, Dr. Perry, Mr. Coit Campbell and Mr. W. A. Watson. The witness' expenses for coming to Chicago were paid by Mr. George T. Levy, a lawyer from Sumter. He expects to receive compensation for his services. Mr. Levy spoke to him about coming to Chicago.

Mr. T. J. Scofield: Q.—Who is that? When did you first talk to Levy about it? *A.*—I did not talk to him till he called up over the phone.

Q.—That was before you left Chesterfield? *A.*—Yes.

Q.—What did you tell the Court a while ago and this jury that nobody ever talked to you about coming up here except Miss Ervin, for? That was not true, was it? *A.*—He called me up to come.

Q.—That was not true, was it? *A.*—I don't know.

Q.—You don't know whether it was true or not? What is your reputation for truth and veracity down there?

Mr. Fowler:—That is objected to.

THE COURT:—Objection sustained.

To which ruling of the Court the defendants, etc., excepted.

REDIRECT EXAMINATION BY MR. FOWLER

The witness stated that Dr. Newsom is well known around Chesterfield. Chesterfield is connected by a branch line with Ruby, and also by county roads.

RECROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that he could not distinguish between a reputation for truth and a reputation for veracity, and that the reputation of Dr. Newsom was bad both for truth and veracity.

TESTIMONY OF MR. W. A. WATSON

Mr. W. A. Watson was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Watson testified that he lives in Chesterfield, S. C. He knows Dr. Newsom and Mr. J. S. McGregor. Mr. McGregor worked in the drug store in Ruby. Dr. Newsom had an office near the drug store. Mr. Watson stated that neither Dr. Newsom nor Mr. McGregor had ever seen him drinking Wine of Cardui. He has never taken a drink of

Wine of Cardui in his life unless it was for medicine and he did not know what it was. He did not know there was any alcohol in it. The first time he saw a bottle of Wine of Cardui out of the carton was about three weeks ago when he asked to look at one to see how it looked, and after he had heard Dr. Newsom's testimony in the trial.

The witness testified that he has never mixed any Cardui with coca cola, and that there was never any coca cola bottles in the drug store. He stated he had drunk glasses of coca cola at the fountain in the drug store. He stated that the first one who talked to him about coming to Chicago was a man whose name he has forgotten. Later a woman talked to him about coming to testify and then another man named Mr. Levy who brought him here.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Mr. Watson testified that he drinks a little sometimes and has been drunk on occasions.

Q.—That is a dry territory down there? *A.*—Yes, sir.

Q.—So when you get anything to drink you have either got to get moonshine whisky or something from a drug store, haven't you? *A.*—No, sir, they don't get any around there in the drug store that I know of. I never got any from them. I never got any liquor at any drug store there.

Q.—But you get Manola and stuff like that? *A.*—I have bought some bitters of one kind or another around the drug stores.

Q.—What kind of bitters have you bought? *A.*—Hostetter's?

Q.—And what else? *A.*—Well, I believe I bought some Peruna at another time.

Q.—What else? *A.*—I don't know, sir.

Q.—Well, you bought whatever there was to sell? *A.*—Whatever I could find of that, some bitters of one kind or another.

Q.—Different sorts of tonics and bitters? *A.*—Yes, sir.

Q.—And you can get drunk on them all right? *A.*—No, sir, I didn't particularly get drunk on that. Sometimes I would buy that after I had been drinking liquor, drink a few bitters.

Q.—Well, you take the liquor and the bitters, and those two would do the work, wouldn't they? *A.*—Well, I didn't—it didn't make me drunk. I bought it just the same to help my feelings a little.

Q.—Do you get the moonshine whisky down there? *A.*—Well, I can order—we can order whisky down there.

Q.—I say, do you get moonshine whisky? *A.*—Moonshine whisky?

Q.—Or corn whisky? *A.*—Corn whisky?

Q.—Yes? *A.*—Yes, we get corn whisky.

Q.—Where do you get that? *A.*—Jacksonville, Florida, or anywhere we order it from.

Q.—Is it red or white? *A.*—Red or white?

Q.—Yes? *A.*—Either kind you order.

Q.—You get whatever you want? *A.*—Yes, sir.

Q.—You can get red eye or white whisky there, is that right? *A.*—Oh, yes, sir.

Q.—Now, the white whisky is moonshine whisky or corn whisky, isn't it? *A.*—I don't know what you call moonshine whisky.

Q.—You said you never drank Wine of Cardui that you know of, that is right, is it? *A.*—Yes, sir, I never drank none that I know of.

Q.—What is it? *A.*—I never drank any Wine of Cardui.

Q.—Didn't you say a while ago you didn't ever drink any that you knew of? *A.*—I said I had never drank it.

Q.—Is that what you said? *A.*—Yes.

Q.—When you get full, do you know what you are drinking? *A.*—Yes, I know what I am drinking.

Q.—All the time? *A.*—Yes, sir, I know what they call it.

Q.—You know what they call it? *A.*—I know whether it is whisky or whether it is bitters or Cardui.

Q.—You don't know whose bitters it may be. It might be Hostetter's Bitters, or it might be Peruna? *A.*—It might be Hostetter's Bitters or Peruna or whisky. I know Hostetter's Bitters and Peruna and whisky apart. I know the difference in them.

Q.—You know them as you see them, but I say, when you are drinking, when you are full, you don't pay much attention to what is on the bottle? *A.*—Well, I think I know what I am drinking.

Q.—Well you say you generally know what you are drinking? *A.*—I generally know what I am drinking.

Q.—Do you mean that? Is it true all the time you take a drink, do you know what it is? *A.*—Well, I know something about it. I claim to think I know something about what it is, you know. I ain't no analyzer at all. I could not tell exactly, but I go by the label that is on it.

Q.—In drinking liquors, do you get—you say you get drunk. Do you have protracted sprees? *A.*—Well, I have been tight.

Q.—How long would you stay that way sometimes? *A.*—I take sometimes a little nap of sleep, or something like that. I have stayed tight off and on, a day or two.

Q.—You read, do you? *A.*—Read? No, sir, I got no learning. Very little learning, can't read much.

Q.—Can you read anything? *A.*—I can read a little, not much.

Q.—Could you read what is on the label of the bottle? *A.*—Yes, sir.

Q.—You think you could read that, could you? *A.*—Oh, yes, I can read anything like liquid bitters, or Hostetter's or something like that.

Q.—Can you read "Hostetter's Bitters" and tell it by reading it? *A.*—I can see it on the bottle, and know what it is.

Q.—Can you pick up a bottle— *A.*—No, sir, I cannot read all that is on it.

Q.—You cannot read it all. All right. Now, can you sign your name? *A.*—Yes, sir, I can, not with a pen. I am nervous, and I ain't got no learning. I can write my name, though.

TESTIMONY OF MR. R. T. M'CREIGHT

Mr. R. T. McCreight was called as witness for the plaintiff.

DIRECT EXAMINATION BY MR. FOWLER

Mr. R. T. McCreight testified that he is in the drug business in Ruby, S. C. Dr. Newsom is president of the drug company, and has been since 1911. Mr. McCreight owns the controlling interest in the drug company. He is secretary and treasurer and carries on the business. He generally has one clerk.

The witness does not know of selling Wine of Cardui to W. A. Watson. He may have sold some to Loney Watson. He does not recall selling any to Coit Campbell. He has not sold coca cola in bottles. The only purchase of Wine of Cardui which he remembers was twelve dozen bottles purchased when he first came to the drug store in 1913. The last of that twelve dozen were sold three or four days before he came to Chicago as a witness. Mr. McCreight is a brother-in-law of Mr. McGregor.

Q.—I read you this, testified to by McGregor: "Do you know about how much of it he sold a month? Answer. Why, he would sell something like a gross. He would buy it in twelve dozen bottles at a time, a gross at a time. Question: A gross at a time, and how long would a gross last, how soon would he sell it? Answer: About 30 days as I remember." Now, is that true or not?

Mr. T. J. Scofield:—I object to the form of that question.

Mr. Fowler: *Q.*—State whether or not there was sold in this store over a gross of bottles of Wine of Cardui, within 30 days?

Mr. T. J. Scofield:—That is objected to.

Mr. Fowler: *Q.*—Or within 45 days.

Mr. T. J. Scofield:—That is objected to.

THE COURT:—What is the objection?

Mr. T. J. Scofield:—If he wants to ask him how much was sold, I don't object to it.

Mr. Fowler:—I am contradicting your witness.

THE COURT:—What is the most that you ever sold in any one month? *A.*—We have not sold anything like a gross. I think we average something like five or six bottles a week maybe.

Dr. Newsom told the witness that his testimony (Dr. Newsom's) had been published in THE JOURNAL.

Mr. Fowler:—What did he say about the testimony, as there given?

Mr. T. J. Scofield:—That is objected to, if the Court please.

Mr. Fowler:—I will state to your honor what I desire.

THE COURT:—He may answer.

To which ruling of the Court the defendants, etc., excepted.

Mr. Fowler: *Q.*—Go ahead. *A.*—He told me that he had read his testimony, and he did not realize that he had testified to what he had, until he read his testimony.

Mr. T. J. Scofield:—Now, if the Court please, I move to strike out his answer.

THE COURT:—On what ground?

Mr. T. J. Scofield:—Because it is hearsay, and no foundation laid for it, and it is highly improper, in my judgment.

THE COURT:—Why, very frequently hearsay evidence is made use in impeachment of a witness.

Mr. T. J. Scofield:—It is entirely immaterial, if the Court please.

THE COURT:—Well, the weight of it is a question for the jury. He said he did not realize what he testified to—what he did.

To which ruling of the Court the defendants, etc., excepted.

Mr. Fowler: *Q.*—Did he state to you in what respect he did not realize what he testified to?

Mr. T. J. Scofield:—I object to that, if the Court please, because that is hearsay, it is immaterial, and no foundation laid for it.

THE COURT:—State what the doctor said about his testimony.

Mr. T. J. Scofield:—I object to the Court's question.

To which ruling of the Court the defendants, etc., excepted.

The Witness:—Well he—sir, he told me how he was sorry that he brought the Ruby Drug Company into it—

Mr. Fowler:—Brought who into it? *A.*—Ruby Drug Company and myself. He told me that it worried him more than anything that had ever happened in his life.

Mr. T. J. Scofield:—Now then, I move to strike out all that Dr. Newsom is supposed to have said.

THE COURT:—Is that all he said?

The Witness:—That is about all I remember.

THE COURT:—That answer may stand.

To which ruling of the Court the defendants, etc., excepted.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Mr. T. J. Scofield asked that everything that the witness stated that Dr. Newsom is supposed to have said be stricken out on the ground that it is hearsay. The Court stated that it was immaterial and ruled that it might stand.

Mr. McCreight stated that he did not remember selling any Wine of Cardui to Coit Campbell, but his clerk may have sold some. He has sold Wine of Cardui to Loney Watson. He does not know how many bottles the clerk may have sold.

REDIRECT EXAMINATION BY MR. FOWLER

The witness identified a signature as the genuine signature of Dr. Newsom. Mr. Fowler endeavored to introduce an affidavit made by Dr. Newsom since leaving Chicago after testifying for the defendant. The Court ruled that this could not be introduced.

TESTIMONY OF MR. SPENCER SELLERS

Mr. Sellers was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Spencer Sellers testified that he resides in Ruby, S. C. His wife's name is Louise. His business is farming. He knows Dr. Newsom, who treated his wife about three years ago for female trouble. Dr. Newsom made several visits. He did not operate on her. Mrs. Sellers has taken Wine of Cardui, the last time about eighteen months ago. She has taken eight bottles, the witness stated, on the advice of Dr. R. M. Newsom. She took the Wine of Cardui according to the directions on the bottle. The witness stated that Dr. Newsom told him to get the Wine of Cardui and give it to his wife. This Dr. Newsom did in his drug store in Ruby. The witness stated "she was regular and her periods were scanty." He has been married eight years. He stated that his wife was apparently well when she quit taking Wine of Cardui and has been well ever since. The witness has never seen his wife drink Wine of Cardui from the bottle. She would take a tablespoonful three times a day.

The attorneys for the defendant waived the cross-examination.

TESTIMONY OF DR. W. J. PERRY

Dr. W. J. Perry was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Dr. W. J. Perry testified that he resides in Chesterfield, S. C. He has been a practicing physician since 1905. He knows Dr. R. M. Newsom. He considers his reputation for truth and veracity in the community where he resides as bad, and he would not believe him on oath.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Dr. Perry stated that Dr. Newsom sometimes practices in Chesterfield, but his home is in Ruby. Dr. Perry used to do a good deal of practice in Ruby. He has known Dr. Newsom four or five years. Dr. Perry stated that he does both emergency surgery and medicine. He has been practicing medicine since 1900. He was licensed to practice in 1905. He practiced five years before he was licensed. He is a graduate of the Atlanta College of Physicians and Surgeons in 1900. He could not get a license to practice medicine based on that graduation. He took the state board examination in 1905.

Q.—But you had been practicing five years in violation of the law? *A.*—Well, if—

Q.—Answer the question. You either had or had not been practicing five years in violation of the law? *A.*—Yes, sir, I suppose I had.

Mr. Fowler:—Now, explain, doctor.

The Witness:—Sir?

Mr. Fowler:—If you have any explanation to make, make it.

Mr. T. J. Scofield:—Well now, I was asking him—

Mr. Fowler:—He started to explain a moment ago, and you stopped him.

Mr. T. J. Scofield:—If there is anything else you want to say, say it.

The Witness:—Well, there was no objection raised—there was no objection raised from the profession.

Q.—Yes. Nobody kicked about it? *A.*—No, sir.

Q.—So you went ahead and practiced medicine in violation of the law? *A.*—Yes, sir, I suppose you would call it violation of the law.

Q.—Now, do you mean to say by that that the state officials did not catch you at it; is that what you mean to say? *A.*—Well, I did not try to hide it.

Q.—You never were prosecuted, anyway? *A.*—No, sir, I was not prosecuted.

The witness knows Dr. Newsom. He has met him two or three times in consultation. Once he called Dr. Newsom in, and once Dr. Newsom called him in. He cannot remember exactly when. Probably some three or four years ago. He has not been an associate of Dr. Newsom socially or otherwise for the last year or two.

Q.—Are you on good terms with Dr. Newsom? *A.*—Now?

Q.—Yes? *A.*—I speak to him, yes.

Q.—That is not what I ask you. I asked you if you were on good terms with him? *A.*—Well, we greet each other—speak when we pass. I cannot say that I love him.

Q.—Do you know whether he loves you? *A.*—I don't expect he does.

Q.—You don't expect he does? *A.*—No.

Q.—The fact is that there is some sort of grievance between you and Dr. Newsom, is there not? I am not asking what it is, I am asking you if that is not the fact? *A.*—Well, I did not think he treated me right in the case I met him on.

Q.—I did not ask you to tell what it was. I say you are mad at Dr. Newsom, are you? *A.*—Mad with him?

Q.—Mad at him, angry at him, or with him? *A.*—No, sir, I am not angry at him.

Q.—You are not angry with him? *A.*—No, sir.

Q.—You were, were you not? *A.*—At one time I was worried about some things I had heard him state, yes.

The witness then gave the names of persons whom he had heard say things about the reputation of Dr. Newsom for truth and veracity. He mentioned Mr. R. D. McCreight, Mr. J. D. McGregor, Rev. A. B. Smith of Wexford, Dr. Funderbuck of Mt. Croghan; Mr. Wiley Watson, Dr. Vaughan at McBee; Dr. Ingram at McBee, and Coit Campbell.

The witness stated that he had a falling out with Dr. Newsom three or four years ago and that he has heard the majority of these things since that time. He stated that Dr. Newsom has a very good practice, and that he does not think Dr. Newsom has a larger practice than any other doctor practicing around there. The witness testified that Miss Ervin asked something about Dr. Newsom. The witness understands that Miss Ervin represents the Chattanooga Medicine Company. He first saw Miss Ervin five or six weeks ago. Mr. Levy arranged for the witness to come to Chicago.

The witness is president of the Chesterfield Drug Co. This drug company sells Hostetter's Bitters, Peruna, Wine of Cardui, Manola and the whole line.

The witness is not a member of the medical society of the State of South Carolina. He stated that there are doctors in his county who are members of the state society.

REDIRECT EXAMINATION BY MR. FOWLER

The witness stated that a county medical society was recently organized at Cheraw. He was invited to go in but did not do it. He stated that he is acquainted in Patrick, S. C., but he is not acquainted with the name McNab.

TESTIMONY OF DR. C. A. GLOVER

Dr. C. A. Glover was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Dr. C. A. Glover testified that he resides at Chesterfield, S. C., and he has lived there since December, 1915. He previously lived at Ashford, Ala. He knows a few of the people in Ruby. The witness knows practically all the people in Chesterfield and has practiced some in Ruby. He has been in Dr. Newsom's home. The witness considers the general reputation of Dr. Newsom in the community for truth and veracity as bad, and he would not believe him on oath.

The witness lived in Ashford from August, 1910, until November, 1915. He graduated in the Atlanta School of Medicine. He is acquainted with Frank Sellers, of Cottonwood, Ala., and considers the general reputation of Frank Sellers for truth and veracity as bad and he would not believe him on oath. He knows Josh Granger, but has had no dealings with him.

Dr. Glover has prescribed Wine of Cardui three or four times. He prescribed for his wife when she was troubled with dysmenorrhea. He has been married five years. He prescribed Wine of Cardui for his wife about three years after he was married. Previously he had given her practically everything he knows with only temporary relief. He obtained equally as good results and practically better with the Wine of Cardui than any other remedies. He stated that his wife has Wine of Cardui at home and still uses it occasionally. She begins five or six days before the period and takes it through the period.

Dr. Glover also prescribed Wine of Cardui for E. W., who suffered amenorrhea and scanty menstruation mostly at her periods. Before using Wine of Cardui he gave her ovarian extract, hydrastis, ergot, iron tonics of various kinds, strychnin and arsenic with practically no result. He testified that he began to use Wine of Cardui about January, 1915, and the patient is practically well. She did not know what she was taking as he did not prescribe it in the original bottle. The patient is now all right. He last saw her on Wednesday previous to testifying.

The witness also prescribed Wine of Cardui for Mrs. F. McK., who suffered with dysmenorrhea; she is a school teacher. She had been married five years. He began treating her after she was married, giving her viburnum and various viburnum compounds, H. V. C., and hydrastis. He sometimes used deodorized tincture of opium and advised rest in bed during the period. He obtained very little results, stating that the patient was sick for a week at each period. In 1912 or 1913 he began to give Wine of Cardui, but she did not know what she was taking at the time she commenced taking it. She knows it now and keeps it on hand in the original bottle. While he was prescribing Wine of Cardui he also gave her cardo-septic tablets as a local application. He considers the results good. Since that time the patient has been able to teach school and does not lose any time. She had leukorrhea before but has not leukorrhea now.

The witness also prescribed Wine of Cardui to Miss M., 13 years of age, who had been suffering with amenorrhea. She had never menstruated. He first gave her ovarian extract, ergot, hydrastis, and Jamaica dogwood. The patient would have pains in the stomach and nervous attacks, and would faint. He did not secure any results with the previously mentioned remedies. For four or five months he gave her Wine of Cardui and the patient is all right today. "Whether Cardui did it or not, she is all right." He does not know whether or not she is still taking Wine of Cardui.

The witness stated that he does not know a man by the name of Bob Cook, who ran a drug store in Ashford.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

On cross-examination the witness stated that he graduated at the Atlanta School of Medicine. He took the Alabama Board and passed it. He took the examination one time. He did not take any other examinations elsewhere.

The witness has been married about five years and has one child. He testified that his wife suffered with dysmenorrhea and he does not know the cause. He thinks the principal cause is endometritis. She also had leukorrhea. He does not know the cause of these conditions. He tried to find out and made an examination with a speculum. He did not use a microscope. His wife has no discharge now to amount to anything. The witness stated he did not think it necessary to make a microscopic examination. His wife has endometritis to some extent. Mrs. Glover was also examined by Dr. Moody of Dothan, Ala. He knows that Dr. Moody did not use a microscope to examine the discharge. The manifestation of endometritis is a leukorrhea discharge, he believes. Dr. Glover stated that the leukorrheal discharge has not been bad in the last two years, but Mrs. Glover still has it to some extent and also some pain. He stated that the following conditions may produce endometritis: gonorrheal infections, lacerations, retroflexion and retroversion, prolapsus, ovaritis and infections of the fallopian tubes.

The witness examined his wife's uterus and found it in the proper position with no lacerations. He was not able to find any evidence of infection in the tubes. He thinks that by palpation of the ovaries and the tubes he could determine that everything was right in the tubes. The ovaries are all right as far as he knows. He undertook to palpate the ovaries, and so far as he knew they were normal. He stated that he probably could not palpate the ovaries if they were normal, and finally, he knew the ovaries were normal because he could not palpate them. He stated that if there is any active inflammation of the ovaries they may be palpated. Dr. Glover believes that if there is an active inflammation of the ovaries they would probably be inflamed, tender and sensitive and that they might not be palpated in every case. He thinks Mrs. Glover's condition was a simple endometritis. The cervix of the uterus was small and he believes that the small cervix set up the endometritis from irritation. He stated that very likely there would be some form of infection with it. He knows that Mrs. Glover did not have specific infection. He has not examined the cervix for some time. He last examined it about a year ago and found it larger than on the first examination. He does not know what caused it to contract in the first place nor what caused it to enlarge. The witness stated that a woman could have a contracted cervix after giving birth to a child. He believes that she could have painful menstruation without a contracted cervix. In treating his wife he used douches of normal salt solution and of cardo-septic. He also used H. V. C. and hydrastis.

Q.—What is H. V. C.? *A.*—H. V. C. is some form of viburnum, in which there is a little oil of anise and cloves, and alcohol—

Q.—What is that? *A.*—H. V.—Hayden's Viburnum Compound.

Q.—What is Hayden's Viburnum Compound? *A.*—I just mentioned it, that it has alcohol and viburnum and oil of anise, and oil of cloves, aromatic—

Q.—How do you know it has? *A.*—That is what it has on the bottle—I don't know.

Q.—What is the viburnum? *A.*—Viburnum opulus.

Q.—Viburnum opulus? *A.*—Yes, sir.

Q.—How much alcohol is in it, do you know? *A.*—No, sir; I certainly don't.

Q.—It is a proprietary medicine, is it not? *A.*—It is a proprietary medicine.

Mr. Fowler:—Your Honor, I think this is going beyond cross-examination.

Mr. T. J. Scofield: *Q.*—In what size doses did you give it? *A.*—A teaspoonful in hot water every two or three hours, according to the indications, whether you get relief or not.

Q.—What else did you give her? *A.*—I gave her ergot; hydrastis.

Q.—What did you give the ergot for? *A.*—For a tonic—uterine tonic.

Q.—What doses did you give it? *A.*—About 15 drops, three times a day.

Q.—Ergot, fifteen drops three times a day? *A.*—Yes, sir.

Q.—That is the medicinal dose, is it? *A.*—That is the tonic dose.

Q.—On what theory did you give her ergot? *A.*—To increase the congestion of the pelvic organs—increase the blood supply and tone it up, as a general tonic—which it is supposed to do.

Q.—Doesn't it do just—doesn't it have just the opposite effect, Doctor? *A.*—No, sir; that is in the tonic doses—it increases it, hydrastis—

Q.—On a contracted cervix what would be the effect of ergot, in—

THE COURT:—Mr. Scofield, this witness does not appear as an expert, you know. He is testifying about facts.

The Witness:—I am testifying to what I know.

Mr. T. J. Scofield:—I do not know whether he is or not, Your Honor, but I know he is testifying to certain things that he professes to have done.

THE COURT:—Yes.

Mr. T. J. Scofield:—And the reason why he did it.

The Witness:—I can give you—

Mr. T. J. Scofield: *Q.*—Now, as to the physiological action of those things that he used, I think I am entitled to an answer.

The Witness:—I do not know the physiological action of everything—every drug I use. I use a heap of things. I don't know the component parts of Wine of Cardui, for that matter. I know it has done good. I use anything that is good. I try out—and will give it a trial—I am not a "patent medicine" man, or anything like that; but I know what I used—

Mr. T. J. Scofield: Q.—I am not asking you—
Mr. Fowler:—Let the witness finish.
Mr. T. J. Scofield:—I am not going to sit here and listen to a speech of that kind.
Mr. Hough:—You should listen to his explanation.
Mr. T. J. Scofield:—I am objecting to that sort of an answer and move that it be stricken out.
Mr. Hough:—Finish your answer.
Mr. T. J. Scofield:—I am objecting, if the Court please, to any such answer.
THE COURT:—The witness said he did not know what was in a great many drugs which he gave, but he was willing to give anything a trial—that is what I think he said.
Mr. T. J. Scofield:—What I am inquiring about is the physiological action—
The Witness:—I don't know. I don't know the physiological action of all things.
THE COURT:—Well, he says he don't know.
The Witness:—I am not supposed to know.

Dr. Glover testified that the first one he gave Wine of Cardui to was Mrs. F. McK. He did not know what was in the Wine of Cardui. He was trying to see whether it was any good. Wine of Cardui was sold in the drug stores in which he was interested, but he is not interested in any drug store now. He prescribed the Wine of Cardui, but not in the original bottle.

An adjournment was taken until 2 o'clock the same day.

May 22, 1916, Afternoon

TESTIMONY OF DR. C. A. GLOVER (*Continued*)

Dr. C. A. Glover resumed the stand as a witness on behalf of the plaintiff in rebuttal.

FURTHER CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness stated that he is testifying concerning three patients to whom he gave Wine of Cardui. In two cases they were girls with amenorrhea, who were thirteen or fourteen years old. He does not know how long they had been troubled with the condition before he treated them. He stated that he did not know what the cause of the amenorrhea was in either of the cases. He did not try to find out the cause but treated them for the symptoms. He thinks the cause in one case was anemia caused by chlorosis, perhaps from malaria. He treated this patient with quinin, strychnin and arsenic. He did not give her Wine of Cardui until he had given her these tonics. He did not know whether or not the quinin did any good because he did not examine her blood.

Besides the quinin he gave her Warburg's tincture. He thought that she needed medicine besides that to remove the malarial element. He does not think that removal of the cause allows the conditions to right themselves. Dr. Glover stated that he did not know the cause of the amenorrhea in the second case. He gave her 2½ or 3 grain doses of ovarian extract three times a day. He stated that the ovarian extract increased the secretion of the ovary. He stated that there is an internal secretion of the ovary but the medical profession does not know what it is. It is an internal secretion like that of the suprarenal glands. Because the treatment was not doing her good he gave her Wine of Cardui—just to see what it would do. The patient got better, but he would not swear that the Wine of Cardui did the work.

There are 1,200 people in Chesterfield; the witness knows most of them. He also knows a few people in Ruby. He met Dr. Newsom once since moving to Chesterfield. He has no personal acquaintance with Dr. Newsom and does not want to know him. He gave the names of the people whom he has heard speak of Dr. Newsom's reputation for truth and veracity. He also gave the names of the people whom he heard speak of Frank Sellers' reputation for truth and veracity. He then gave the names of the people whom he heard speak of Josh Granger's reputation for truth and veracity.

The witness stated that the only ones with whom he spoke about coming to Chicago were Mr. Levy and someone from Bowling Green, Ky.

REDIRECT EXAMINATION BY MR. FOWLER

The witness stated that someone had corresponded with him from Bowling Green, Ky., about coming to Chicago. This was at the time when he lived in Ashford. He answered the letter and they sent him a blank to fill out. Later Dr. Moody at Cottonwood told him about the suit.

The witness testified that he was giving quinin three or four months before he gave Wine of Cardui and the girl had not gotten any better in the meantime.

TESTIMONY OF MR. CLARENCE L. GOLDSTEIN

Mr. Clarence L. Goldstein was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Goldstein testified that he resides in Oakdale, Tenn., and he has known Joe Cooper for ten or twelve years. The witness is an engineer on the C. N. O. & T. P. Railway. He has been an engineer for two years and two months.

The witness testified that he did not tell Joe Cooper that he drank Wine of Cardui. He never tasted it that he knows about. He has seen it in bottles. He does not know that Wine of Cardui has alcohol in it or anything about its ingredients. He stated that six or eight months ago Joe Cooper told him that there was a gentleman in Oakdale to see him about coming up as a witness.

The witness testified that when Cooper came back to Oakdale after having been in Chicago he asked Mr. Goldstein would he give him a statement that he had drank Wine of Cardui and did not know what it was. The witness stated that no one had ever offered him any money to testify for the defendant.

Mr. Scofield offered the record to show that Joe Cooper had not testified that the witness had drank Wine of Cardui. He had stated that Mr. Goldstein had drank whisky.

THE COURT:—I think that part of it may stand. I think you ought to be in a position, gentlemen, to point out in the record what you are trying to impeach the former witness on, because it ought not to be necessary for it to be all read over here. You ought to know, it is your witness.
Mr. Fowler:—Your Honor, I did not know. I know he testified to that particular thing.
THE COURT:—Unless you are prepared to show about Cooper offering him money, I shall sustain the objection.
Mr. Walker:—I am only talking from recollection.
THE COURT:—I will give you an opportunity to show me that, if you have it there.
Mr. Fowler:—You can cross-examine. I don't remember that he was examined about it.
Mr. T. J. Scofield:—There is nothing to examine on, your Honor, that is all. So that answer to that question—is that in or out?
THE COURT:—It is in, if the question was asked in the record and it is out, if it was not.
Mr. Walker:—Then we will examine the record, and tell your Honor whether it is there or not. If it is not there, it ought to be out.

(Cross-examination waived.)

TESTIMONY OF MR. W. J. JOHNSON

Mr. W. J. Johnson was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. W. J. Johnson testified that he lives in Oakdale. He has been engaged in business for 14 years, and has known Joe Cooper 10 or 11 years. He considers Joe Cooper's general reputation for truth and veracity as bad, and he would not believe him on oath.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that Joe Cooper has been a barber for three or four years. He has been working pretty steadily at this job for the last three or four years. He thinks Cooper owns his shop. The witness does not shave in Cooper's barber shop. Joe Cooper lives on one side of the Emory River and the witness lives on the other side. Joe Cooper is a married man with one child. He occasionally buys goods from the witness. He owes the witness some money, which the witness lent him some six or seven years ago. Joe Cooper is a poor man.

REDIRECT EXAMINATION BY MR. FOWLER

The witness testified that he is a member of the City Council. He stated that his judgment as to the reputation of

Joe Cooper is not biased by the fact that Joe Cooper owes him money.

TESTIMONY OF MR. T. J. LYNCH

Mr. T. J. Lynch was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Lynch testified that he is a road foreman of engines for the C. N. O. & T. P. R. R., and resides in Oakdale, Tenn. He has lived in Oakdale for nine years and has known Joe Cooper for eleven years. He considers Joe Cooper's reputation bad and would not believe him on oath.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that he has had dealings with Joe Cooper. He lent him a fish net once and Joe Cooper would not pay for it. Joe Cooper has done some barber work for the witness. Joe Cooper owes him about $6, and the witness paid him for the barber work. The fish net transaction occurred three or four years ago. The witness has not felt unkindly to Joe Cooper since, but he does not think he is honest. He mentioned several persons who had spoken to him about Joe Cooper's reputation.

REDIRECT EXAMINATION BY MR. FOWLER

The witness stated that he had also heard other persons speak about Joe Cooper's reputation.

RECROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness named several others whom he heard talk about Joe Cooper. Following the appearance in Oakdale of a man from the Chattanooga Medicine Co., the witness and others were talking about Joe Cooper's reputation. The witness testified that he paid his own expenses to Chicago and he expects the Chattanooga Medicine Co. to pay him back and to pay him a per diem.

TESTIMONY OF MR. H. J. ELLIS

Mr. H. J. Ellis was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Ellis testified that he resides in Ashford, Ala. He is a druggist and has been living there for three years. He knows Josh Granger, and has known him for three weeks. He considers Josh Granger's reputation for truth and veracity as bad. He is not well enough acquainted with him to say that he would not believe him on oath. The witness obtained his knowledge of Granger's reputation from Dr. Granger, who is a distant relative of Josh Granger, and from Mr. Gresham. The witness did not know anything about Granger's reputation before three weeks ago.

Mr. Scofield moved that the evidence be stricken out. The Court stated that it could stand for what it is worth—that is, the three weeks' reputation.

The witness stated that he knows nothing about the reputation of Mr. Sellers.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that he knows nothing about Josh Granger except what the gentlemen mentioned have said.

THE COURT:—Let me ask a question. Were you investigating for yourself or did somebody come up and confide in you that this man did not tell the truth? *A.*—No, sir, I was not investigating for myself.

Q.—How did it happen that this came up? *A.*—It came up when we were reading the American Medical Journal, reading his testimony.

Q.—Who was reading it? *A.*—Dr. Granger and several other fellows, Dr. Glover.

Q.—Where was this, in lodge meeting or in the railroad station or the general store, or where was it? *A.*—It was in the drug store at home.

Q.—How many people were there? *A.*—Why, I suppose there was three or four standing around.

Q.—And the information you got about this man was received at that time? *A.*—Yes, sir.

Q.—And only from the people that were in the drug store at that time? *A.*—People that actually know him. I did not, only I had met him.

Q.—The information came from the people that were in the drug store at that time? *A.*—Yes, sir.

Mr. T. J. Scofield: *Q.*—Was Dr. Glover there? *A.*—Yes, sir.

Q.—That is the doctor who was on the witness stand a while ago? *A.*—Yes, sir.

Q.—Did he have THE JOURNAL there? *A.*—Really I do not know, sir. I don't know where THE JOURNAL came from, but it was there.

Q.—It was there? *A.*—Yes, sir, I do not know even who it belonged to.

Q.—In that conversation Dr. Glover took part? *A.*—No, sir, he did not.

Q.—Well, he was there present? *A.*—He was there present.

Q.—Dr. Glover has not been living—how long did Dr. Glover live in that town? *A.*—Well, he lived there about three years since I came there. He came there—I came there three years ago. He was there then and I understand that he was there two years prior to that time.

Q.—He is not living there now? *A.*—No, sir.

Q.—But he had come down there, had he, from up at Chesterfield? *A.*—Yes, sir.

Q.—And was there that evening when this conversation was going on? *A.*—Yes, sir.

The witness testified that Mr. E. A. Wheatley arranged for him to come to Chicago. Mr. Wheatley sent him a telegram about four days ago.

TESTIMONY OF MR. G. M. GRESHAM

Mr. G. M. Gresham was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Gresham testified that he resides in Cottonwood, Ala., and has lived there seventeen or eighteen years. He has known Frank Sellers ten or twelve years. He considers Frank Sellers' general reputation for truth and veracity as bad, and he could not believe him on oath.

The witness is now in the livery business. He was formerly a druggist. He knows Bob Cook, who kept a general store. Bob Cook died in 1903. The witness testified that when he kept a drug store he sold perhaps a half gross of Wine of Cardui a year. He does not know anything about the sales that Sellers' made. Sellers' was a small general store.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Mr. Graham testified that he ran a drug store from 1908 until 1912. He sold Wine of Cardui during that time at $1 a bottle or six bottles for $5. Mr. Sellers was with his father about five miles out in the country. He used to come into town. He would come in and get soda water, Manola, coca cola or Wine of Cardui or anything he wanted to get. He would not sell him pure alcohol, and he does not think that he ever called for alcohol. Frank Sellers is a farmer; he formerly taught school. He teaches practically every winter. Mr. Sellers' father still operates a little store in the country. Practically all general stores in that region sell Wine of Cardui.

The witness testified that Frank Sellers kept a little business in Cottonwood, which ran a few months and "went bursted and smuggled the goods out." People have been talking about him since that time. Afterwards the people located the stock of groceries and took them back. More talk concerning his reputation for truth and veracity has occurred since this lawsuit than before. The witness read about Mr. Sellers' testimony in the Montgomery *Advertiser* and the Dalton *Eagle*. The witness gave the name of various persons who talked about the testimony.

Dr. Ellis asked the witness to come to Chicago. The witness expects to be paid for his expenses and to receive a per diem. Mr. Gresham stated that when Dr. Ellis called him up he told him that he (Dr. Ellis) was working for the Wine of Cardui people. The witness told Dr. Ellis that Mr. Sellers was a crook and he had best let him alone. The witness made this statement owing to the fact that Mr. Sellers broke up the business and on his evidence in this suit as a witness, which was read to him from THE JOURNAL.

REDIRECT EXAMINATION BY MR. FOWLER

On redirect examination the witness stated that when Mr. Sellers broke up he took the goods from the store and delivered them to other houses. Further questions along this line were ruled out by the Court.

RECROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that Mr. Sellers is still employed by the school directors as a schoolteacher.

TESTIMONY OF MR. H. B. WILLIAMS

Mr. H. B. Williams was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Williams testified that he is in the automobile business in Ashford, Ala., where he has lived for 14 years. He was deputy sheriff for four years. He knows Frank Sellers. He considers his reputation for truth and veracity in that section as pretty bad. He does not believe he would believe Mr. Sellers on oath.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Q.—You say you don't believe you would? *A.*—I don't believe I would, no, sir.

Q.—Why do you hesitate, Mr. Williams? *A.*—Well, the reputation that he bears right in his community and in his home section.

Q.—Well, I know, but why do you hesitate, I say, about it? *A.*—Well, I wanted to look into it before I went to put a man's oath down.

Q.—What? *A.*—I wanted to look into it before I put the man's oath down.

Q.—Sure, you wanted to know? *A.*—I wanted to feel that I was right about it.

TESTIMONY OF MR. DOW HARRELSON

Mr. Harrelson was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. Harrelson testified that he resides in Charleston, S. C. He knows J. Reed McCoy who lives in St. Charles, which is about 55 or 60 miles from Charleston. The witness testified that McCoy did not at any time see him drink Wine of Cardui. He stated that he has never drunk Wine of Cardui. Attorneys for the defendant waived the cross-examination.

TESTIMONY OF MR. WILLIAM MARBURY (*colored*)

Mr. William Marbury was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. William Marbury testified that he resides in Sylacauga, Ala. He was raised in Kellyton and left there about six months ago. He used to work for Mr. Hester. The witness was known in Kellyton as "Button." The witness was the only colored man in Kellyton called "Button." He knows Dr. Maxwell. He stated that Dr. Maxwell never saw him drink Wine of Cardui.

The witness testified that he does not drink whisky or anything like it. The attorneys for the defendant waived the cross-examination.

TESTIMONY OF MRS. E. E. GILLIAND

Mrs. E. E. Gilliand was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mrs. E. E. Gilliand testified that she has lived in Kellyton for ten months. Her maiden name was Sally Bailey. So far as she knows she is the only Sally Bailey that married a Gilliand. Her husband's name is Edward. Before marriage she taught school. The witness knows Dr. Maxwell. He did not treat her in 1912.

The witness is now taking Wine of Cardui. She began taking it in February or March. When Dr. Maxwell took care of her last December nothing was said to him about Wine of Cardui. She first told Dr. Maxwell that she was taking Wine of Cardui the first of the week before he came up here. She has not taught school since she was married. She stated that it was not mentioned between her and Dr. Maxwell how much Wine of Cardui she was taking. She first took three tablespoonfuls a day, and after that two tablespoonfuls a day. She considers that she is in better condition than when she first began to take it.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that her health is not as good as it ought to be and has not been good for some time. Her health has been bad for several years. She first began taking Wine of Cardui in 1911. She took about five bottles. She did not take any in 1912 or 1913 that she remembers of. She may have taken one or two bottles, but never more than that at one time. In 1916 she commenced taking it again—during the last of February—and is still taking it.

DEPOSITIONS

Some depositions were then read and an adjournment was taken until Tuesday, May 23, 1916.

(*To be continued*)

Correspondence

The Prone Trendelenburg Position

To the Editor:—In performing proctectomy following coccygectomy, with or without partial sacrectomy, the patient is placed prone in the shape of an inverted V, the buttocks at the apex. This position is usually, but erroneously I believe, called the reverse Trendelenburg. I am writing to suggest that it be called the prone Trendelenburg, a name which more accurately describes the relation of the two positions—one supine, the other prone.

HERMAN B. GESSNER, M.D., New Orleans.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

AROMATIC SPIRITS OF AMMONIA

To the Editor:—The query of Dr. W. R. T. concerning aromatic spirits (THE JOURNAL, July 1, 1916, p. 65) recalls to my mind an incident which happened to me a few years ago. As I was returning from my vacation, the train on which I was traveling through New England struck a carriage containing an elderly couple. The man was not seriously injured, but the woman was pulseless and in a state of profound shock. They were both put in the baggage car and the train sped on its way toward the next town. In the interval I gave hypodermic injections of digitalis and strychnin. When we arrived at the town the local doctor, who had been summoned by telegraph, was there to meet us. He stepped aboard the train, felt the woman's pulse, opened his medicine case, poured out some yellowish liquid into a glass, gave it to the patient, who was by this time beginning to recover consciousness, and stepped back saying with dramatic fervor, "Now you can move her with perfect safety." I was eager to learn what this wonderful remedy was which could so suddenly banish the evils of shock, and so I looked over his shoulder as he replaced the bottle in his medicine case. It was labeled "aromatic spirits of ammonia."

I wish to point out that not only is the quantity of ammonium carbonate in the aromatic spirits of ammonia too small to have any stimulant action as Dr. T. points out, but that ammonium carbonate in any dose when given by the stomach can have no appreciable effect on the circulation. Being a crystalloid substance it is at once absorbed into the intestinal veins and carried directly to the liver, where it is broken up into urea. So many physiologists have confirmed the fact that ammonium salts are changed in the system to urea that one must regard it as a demonstrated fact. If the ammonium carbonate is injected subcutaneously it is carried to the heart before it reaches the liver, and hence may exercise a stimulant action on the circulatory apparatus. I might also point out, however, that the stimulant effects of ammonium salts even when injected into the circulation are extremely fugacious, lasting not more than five or ten minutes.

Any stimulating effect which may be observed after the oral administration of aromatic spirits of ammonia is due either to a psychic effect or to its local irritant action on the gastric mucosa, just as the irritation by ammonium carbonate, in the form of smelling salts, of the mucous membrane of the nose may reflexly excite the medulla. If the stimulant action of ammonium carbonate administered by the mouth is due to its local irritant effect on the mucous membrane of the stomach, it is evidently a matter of minor importance whether the irritant is alcoholic or ammoniacal or a combination.

HORATIO C. WOOD, JR., Philadelphia.

PASTEURIZATION OF MILK BY FLASH AND HOLDING METHODS

To the Editor:—One of our dairymen plans to put in a pasteurizing plant to care for his milk. He finds there is a difference in opinion as to the temperature and length of time of heating that is considered effective pasteurizing. Before investing he wishes to be sure that he can get the best results from such a plant. Can you give me this information or refer me to some authority?

CHARLES C. ALLEN, M.D., Austin, Minn.

ANSWER.—"Flash" pasteurization consists in heating to a temperature of from 178 F. (Pennsylvania law for pasteurization of dairy by-products) to 185 F. (Michigan law). "Holding" pasteurization employs a lower temperature for a longer period (Michigan law, 145 F. for thirty minutes). The holding process is usually considered safer and more desirable for the pasteurization of whole milk. The U. S. Department of Agriculture has published a number of bulletins dealing with pasteurization, and many of them are available for free distribution.

Medical Education and State Boards of Registration

Colorado April Report

Dr. David A. Strickler, secretary of the Colorado State Board of Medical Examiners, reports the oral, practical and written examination held at Denver, April 4, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 7, of whom 2 passed and 5 failed, including 1 drugless practitioner. Fourteen candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Georgetown University	(1915)	82.1
John A. Creighton Medical College	(1915)	88.5

FAILED

Northwestern Medical College, St. Joseph	(1887)	*
University Medical College, Kansas City	(1893)	*‡
Lincoln Medical College	(1909) 71.1; (1910)	72

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Cooper Medical College	(1911)	California
Chicago College of Medicine and Surgery	(1915)	Wisconsin
Northwestern University	(1905)	Louisiana
College of Physicians and Surgeons, Chicago	(1910) (1912)	Illinois
Keokuk Med. Coll., Coll. of Phys. and Surgs.	(1906)	Oklahoma
State University of Iowa, College of Medicine	(1909)	Iowa
University of Maryland	(1912)	N. Carolina
Barnes Medical College	(1897)	Missouri
St. Louis University	(1913)	Missouri
Washington University	(1906)	Illinois
Bellevue Hospital Medical College	(1891)	Penna.
Medical College of Ohio	(1897)	Ohio
Jefferson Medical College	(1913)	Penna.

* No grade given.
‡ Graduation not verified.

The following questions were asked:

ANATOMY

1. Discuss the composition and structure of a typical long bone. 2. Describe the articulations of the femur. 3. Give complete anatomic description of biceps and triceps muscles. 4. Describe the course and distribution of either the bracial or middle meningeal artery. 5. Describe the lateral sinus. 6. Describe the axilla. 7. Discuss the lymphatic system of the mammary gland. 8. Describe the cerebrospinal fluid, including its habitat (that is, where it is found). 9. What do you understand by the motor area of the brain? 10. Discuss and compare inguinal and femoral hernia.

PHYSIOLOGY

1. Define reflex action. Illustrate. 2. Describe the phenomenon of muscular contraction. 3. Give a general outline of the physiology of the cerebrum, and a minute description of the location and functions of the motor area. 4. How does the eye accommodate for objects at different distances? 5. Mention the properties and functions of the several blood corpuscles. 6. What do you understand by blood pressure, and blood velocity? 7. Give the physiology of respiration, describing the respiratory movements and their innervation; the intrapulmonic and intrathoracic pressure, and the changes in air and blood. 8. Define, classify, name and give action of enzymes. 9. Name five ductless glands, mention their secretion and give the function of each. 10. Give the physiology of menstruation.

CHEMISTRY

1. What is dialyzed iron? 2. What are the properties of hydrocarbons? 3. How is litmus paper made, and what are its uses? 4. How does chemistry assist in diagnosing disease? Give one example and explain it in detail. 5. Describe the chemistry of respiration. 6. What is a chemical antidote? Name one and write the reaction. 7. Give two chemical tests for carbolic acid. 8. What is the composition (chemically) of normal human blood? 9. The alkalinity of the blood is due to what chemicals? 10. What is Gmelin's test (for bile pigments)?

TOXICOLOGY

1. What is a poison? 2. How may poisons be classified? Give examples in each class. 3. Antidote for silver nitrate poisoning. How does it act? 4. Upon what theory are eggs given in case of poisoning with corrosive sublimate? 5. What are chemical antidotes for poisoning with: (*a*) mineral acids; (*b*) caustic alkalies? 6. How do chemical and physiologic antidotes differ in their action? Illustrate each. 7. What are alkaloids? Give the antidote to practically all of them, explaining its action. 8. Differentiate between cholera morbus and acute arsenical poisoning. 9. Give usual causes and symptoms of chronic arsenical poisoning. 10. What are the symptoms of phosphorus poisoning? How distinguished from acute yellow atrophy of liver?

SYMPTOMATOLOGY

1. Give the symptoms, clinical course, diagnosis and complications of acute chorea. 2. Give the symptoms of paralysis agitans. 3. Discuss uremia. 4. Discuss the anomalies of urinary secretion. 5. Discuss the anomalies of thyroid secretion. 6. Discuss purpura. 7. Discuss anemia. 8. Discuss the affections of the myocardium. 9. Discuss jaundice. 10. Give the symptoms, course and complications of scarlet fever.

PATHOLOGY

1. Define sarcoma, carcinoma, epithelioma, endothelioma. 2. Give the pathology of gastric ulcer. 3. Describe the morbid anatomy of tabes dorsalis. 4. Name the animal parasites in Colorado: (*a*) on the body; (*b*) in the intestine. 5. Describe the tumors of the mamma. 6. Describe inflammation of the uterine adnexa. 7. Give the morbid anatomy associated with hemorrhage from the alimentary tract. 8. Describe uterine hydatid mole. 9. Describe uterine tumors. 10. Describe anaphylaxis, leukocytosis, Widal test.

SURGERY

1. Give the signs, symptoms and differential diagnosis of cholelithiasis. 2. Describe the different forms of intestinal obstruction. Give signs, symptoms and differential diagnosis. 3. Give the diagnosis of hemorrhage of the middle meningeal artery. 4. Describe hip-joint disease. 5. Describe Pott's fracture. 6. Describe chronic ulcer of the leg. 7. Give the differential diagnosis of injuries at the shoulder. 8. Describe subphrenic abscess, giving causes, signs and symptoms. 9. Name the herniae of the abdomen. Describe any two. 10. Define arthritis, bursitis, synovitis.

OBSTETRICS

1. Describe local maternal changes at end of first half of pregnancy. 2. Give your method of conduct of a normal labor. 3. Describe mechanism of labor in an L. O. A. 4. Name the positive signs of pregnancy. 5. Discuss puerperal insanity. 6. Diagnosis and treatment of placenta praevia at the eighth month. 7. Indications and contraindications for use of forceps. 8. (*a*) How would you control postpartum hemorrhages? (*b*) How deliver the after coming head? 9. (*a*) Describe the clinical course of extra-uterine pregnancy. (*b*) Differential diagnosis of ectopic pregnancy. (*c*) What would you carry in your O. B. bag? 10. (*a*) Describe briefly your conduct of the puerperium. (*b*) Name the three most frequent causes of hyperemesis gravidarum.

New York January Report

Mr. H. H. Horner, chief of the Examinations Division of the Board of Medical Examiners of the State of New York, reports the written examination held at Albany, Buffalo, New York and Syracuse, Jan. 25-28, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 146, of whom 93 passed, including 1 osteopath, and 53 failed, including 1 osteopath. Four candidates were licensed through the endorsement of credentials and six were granted reregistration licenses. The following colleges were represented:

PASSED

College	Year Grad.	Total No. Licensed
University of California	(1913)	1
Howard University	(1911)	1
University of Louisville	(1912)	1
College of Physicians and Surgeons, Baltimore	(1915)	2
Johns Hopkins University	(1910) (1914)	2
University of Maryland	(1910)	1
Harvard University	(1914) (1915, 2)	3
Detroit College of Medicine	(1913)	1
University of Michigan Medical School	(1913)	1
University of Michigan Homeo. Med. School	(1915)	1
Albany Medical College	(1913) (1914) (1915, 3)	5
Columbia University, College of Physicians and Surgeons	(1912) (1913, 2) (1914) (1915, 5)	9
Cornell University	(1914)	1
Fordham University	(1912) (1913, 2) (1914, 3) (1915, 4)	10
Long Island College Hospital	(1913) (1914, 2) (1915, 5)	8
New York Homeo. Med. Coll. and Flower Hosp.	(1914, 4) (1915, 7)	11
New York Med. Coll. and Hosp. for Women	(1915)	1
Syracuse University	(1915)	3
University and Bellevue Hospital Medical College	(1911) (1914, 2) (1915, 9)	12
University of Buffalo	(1914) (1915, 2)	3
Eclectic Medical College, Cincinnati	(1914)	1
University of Oregon	(1912)	1
Jefferson Medical College	(1913) (1915, 2)	3
University of Pennsylvania	(1913) (1914)	2
Woman's Medical College of Pennsylvania	(1915)	1
Vanderbilt University	(1912)	1
Baylor University	(1905)	1
University of Vermont	(1914) (1915)	2
Medical College of Virginia	(1910)	1
University of Berlin	(1914)	1
University of Naples	(1907)	1

FAILED

University of Alabama	(1909)	1
Chicago College of Medicine and Surgery	(1914)	1
Illinois Medical College	(1898)	1
Tulane University of Louisiana	(1913)	1
Baltimore Medical College	(1913)	1
College of Physicians and Surgeons, Baltimore	(1912)	1
Johns Hopkins University	(1910) (1911)	2
University of Maryland	(1915)	1
Harvard University	(1905) (1907) (1908)	3
Tufts College Medical School	(1904) (1905)	2
Detroit College of Medicine	(1911)	1
Albany Medical College	(1914, 4) (1915, 3)	7
Columbia Univ., Coll. of Phys. and Surgs.	(1913) (1915)	2
Eclectic Med. Coll. of the City of New York	(1910)	1
Fordham University	(1913, 2) (1915)	3
Long Island College Hospital	(1912) (1915)	2
New York Homeo. Med. Coll. and Flower Hosp.	(1912) (1914, 3) (1915, 5)	9
Niagara University	(1898)	1

University and Bellevue Hospital Medical College	(1913)	1
University of Buffalo	(1911) (1914) (1915)	3
Jefferson Medical College	(1913)	1
Medico-Chirurgical College of Philadelphia	(1915)	1
University of Pennsylvania	(1890) (1912)	2
Woman's Medical College of Pennsylvania	(1915)	1
McGill University	(1902)	1
University of Naples	(1905)	1
Syrian Protestant College, Beirut	(1912)	1

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Georgetown University	(1912)	New Jersey
Eclectic Medical College, Cincinnati	(1914)	Ohio
Medical College of Virginia	(1914)	Virginia
University College of Medicine, Richmond	(1907)	Virginia

Book Notices

INFANT MORTALITY. By Hugh T. Ashby, B.A., M.D., M.R.C.P., Visiting Physician to the Manchester Children's Hospital. Cloth. Price, $3.25. Pp. 229, with illustrations. New York: G. P. Putnam's Sons, 1915.

The deaths of large numbers of the male population in the nations abroad as a result of the present war has caused more attention to be given to the prevention of infant deaths. The birth rates of England, France and Germany have been steadily diminishing notwithstanding the fact that more and more attention is being continually given to prenatal care. The author has studied the subject not only in some of the large manufacturing centers of England, but also in some of the large cities of the United States. In preparing this book he has kept in mind wholly the relation of this subject to the public, and has laid less stress on medical and technical aspects. Ashby considers this subject one which must be attacked chiefly from the social side. The physician can act as an instructor in pointing the way. He says:

> The duty of bringing up children belongs to the mothers, and whatever we do we must not be too ready to relieve them of their responsibility; we can, however, do much to see that the rights of the children are not ignored and that the mothers have the opportunity given them of learning how best to rear their children.

The author shows how closely the prevention of infant mortality is interwoven with every social subject. Poverty, alcoholism, lack of education, bad housing, are equally if not more important causes of infant mortality than imperfect hygiene. The book is written in simple language.

CONSTRUCTION, EQUIPMENT AND MANAGEMENT OF A GENERAL HOSPITAL. By Donald J. Mackintosh, M.V.O., M.B., LL.D., Medical Superintendent of the Western Infirmary, Glasgow. Second Edition. Cloth. Price, $6. Pp. 164, with illustrations. Chicago: Chicago Medical Book Company, 1916.

The thirteen chapters of this book deal, respectively, with the receiving department, the medical ward, the surgical ward, the special ward, the nursing staff for each unit, medical officers, outpatient department, kitchen, laundry, nurses' home, semipermanent hospital construction, and provision for nervous and mental diseases. A concise statement of the essentials of a hospital are given, and forms are submitted for use in the admission and care of patients, for bed-books, registers, monthly reports regarding utensils, linen, dressings, and also inventories of outfits for operating amphitheater and wards. Plans are given for the admission department or receiving ward, a maternity department, medical and surgical ward units, outpatient department, dietetic kitchen, laundry and nurses' home. A large insert gives a statistical study of sixty-six hospitals of Great Britain. The book will be useful to those interested in the planning, construction or management of hospitals.

CLINICAL LABORATORY TECHNIC FOR NURSES. By Anna L. Gibson, R.N., Matron of the Boston City Hospital Relief Station. Cloth. Price, $1.25 net. Pp. 194, with illustrations. Boston: Whitcomb & Barrows, 1916.

This book gives concisely and simply all the tests and laboratory technic concerning which a nurse should be informed. A glossary of terms is included and also diet tables for nephritis and diabetes.

Miscellany

Glycerin and Alcohol Not Detoxicants of Phenol

M. I. Wilbert of the Hygienic Laboratory, U. S. P. H. S., remarks (*Pub. Health Rep.*, April 28, 1916, p. 1046) that there are probably few official drugs regarding which more misleading statements have been made than phenol (carbolic acid). Various substances, fixed oils, glycerin, diluted sulphuric acid, the soluble sulphates of the alkalies and alkali earths, have been recommended as antidotes or prophylactics of phenol poisoning Glycerin, for instance, was early observed to lessen the caustic local action of phenol on the skin, and hence it was erroneously inferred that a mixture of phenol and glycerin would be a safe, nontoxic substitute for phenol. As a matter of fact, glycerin will not prevent the production of gangrene or the absorption of phenol. The other substances mentioned have also been found inefficient as detoxicants for phenol, and in many instances distinctly harmful. The value of alcohol as an antidote for phenol poisoning has been scientifically disproved by several investigators (see Clark, T. W. and Brown, E. D.: THE JOURNAL A. M. A., March 17, 1906, p. 782; Macht: *Bull. Johns Hopkins Hosp.*, April, 1915, p. 98). Notwithstanding, even as late as 1915, the fallacy that ethyl alcohol is an antidote to phenol has been embodied in state laws designed to restrict the sale of phenol. Wilbert reports the results of experiments made in the Hygienic Laboratory by Albert F. Stevenson and Rose Parrott to determine the germicidal value of mixtures of phenol and alcohol and of phenol and glycerin, and appends an abstract of a report by Dr. Liston Paine on the effect of alcohol on the toxicity of phenol. It appears that in the presence of water neither alcohol nor glycerin has any detoxicating effect on phenol. Ethyl alcohol, indeed, increases the solubility of phenol in water; it makes the resulting solution more antiseptic and also more toxic. This agrees with the results of Macht (*Bull. Johns Hopkins Hosp.*, April, 1915, p. 98), who found that alcohol given after the ingestion of phenol actually hastened death. Reliance on alcohol and glycerin to neutralize the toxic effects of phenol, in short, is likely to do harm. The exemption of mixtures of phenol and glycerin or phenol and alcohol from legislation restricting the sale of phenol is to be deplored. It is desirable that the fallacy involved should be corrected as speedily and widely as possible.

The Problem of the Chronic Alcoholic

It is generally acknowledged that society has failed in its handling of the problem of the chronic alcoholic. Arrest does not cure drunkenness; the habitual drunkard is unimproved by the cycle of imprisonment, release, fresh debauch, arrest and reimprisonment through which he passes again and again. Dr. V. V. Anderson (The Alcoholic as Seen in Court, *Boston Med. and Surg. Jour.*, April 6, 1916, p. 492), in a study of 100 "repeaters" (total number of arrests for the group, 1,775), emphasizes the cause of this failure, namely, disregard of the fact that the problem is medical as well as social. Only 10 per cent. of these alcoholics were steadily employed; 49 per cent. were not self-supporting when at large. All of them were, of course, a charge on society for the expenses of their arrest, conviction and maintenance while serving their sentences. That society pays a high price for the luxury of maintaining these chronic inebriates is obvious. Anderson found that 56 per cent. of them had a mental level below that of a child of 12; 74 per cent. were mentally subnormal, and all manifested impairment of the nervous system. Thirty-seven were feebleminded, seven insane, seven epileptic, thirty-two possessed a psychopathic constitution, and the remaining seventeen showed alcoholic deterioration. Fifty of Anderson's subjects were steady drinkers, and fifty periodic. Of the steady drinkers only 2 per cent. were rated as of adult intelligence, and only 14 per cent. had a mental level above 12 years. The periodic drinkers possessed a higher level of intelligence and general

capacity, but their unstable natures prevented them from making use of such faculties as they possessed. Anderson concludes that the steady drinker needs prolonged medical care and custodial treatment. The periodic drinker, while he does not need prolonged confinement, does require to be incorporated back into society by means of well directed medical and social service methods of treatment. All, since they suffer from conditions in general regarded as medical problems, should be given the care and treatment accorded to the physically or mentally defective, rather than the ordinary penal treatment afforded them in the past.

Better Reporting of Communicable Diseases

In a discussion of the prevalence of communicable diseases in New York State in 1914, F. M. Meader, director of the division of communicable diseases of the State Board of Health, in *Health News* says that in the group comprising scarlet fever, measles, whooping cough and typhoid fever, the least number of deaths occurred from scarlet fever, the number being 687, of which 452 were in New York City. Deaths from this cause have decreased since 1908, when the number was 1,668. Whooping cough was next lowest, with 730 deaths. This disease has shown a fairly uniform number of deaths since 1908. Measles comes next with a total of 839 deaths, 559 of which occurred in New York City. The highest figure for this disease since 1908 was 1,284, in 1910. Typhoid fever stands highest in the group with 878 deaths, 334 of which occurred in New York City. In a discussion of the question of the completeness of the reporting of these diseases, it is shown that the death rate per hundred cases in New York State was: for scarlet fever, 3.1; for whooping cough, 6.3; for measles, 1.8, and for typhoid fever, 16.0. These rates compare favorably with an average for twenty states and the District of Columbia as tabulated in *Public Health Reports*, Jan. 16, 1914, wherein the rates were shown to be: for scarlet fever, 3.8; for measles, 1.5, and for typhoid fever, 15.1. Meader believes, however, that these rates are all too high on account of the incompleteness of reporting cases everywhere. He says that intensive studies of the actual fatality rate in typhoid fever show that it is about 11 per cent., and if this rate held in New York State in 1914 it would show 2,500 cases unreported. The error would be much greater for measles and whooping cough on account of the well known laxity in reporting these diseases. Better compliance with the law is necessary to determine the actual status of these diseases.

Lead Poisoning in House Painters

The reports of the British departmental committee, appointed to investigate the dangers of the use of lead compounds in the painting of buildings, has been published by the United States Department of Labor, as Bulletin 188. The danger to painters using lead paints was proved, the principal source of poisoning being dust. This dust arises in two ways: first, during the mixing of dry white lead with oil, and, second, in the dry rubbing down process. The former source of danger is daily becoming less with the increasing use of ready mixed paints. Dry rubbing down, however, cannot be diminished, and it seems to have been the opinion of the majority of competent witnesses that, although there would be little or no technical objection to wet rubbing down, it would be extremely difficult, if not impossible, to enforce this regulation. This results from the fact that a great deal of house painting work is carried on in private houses, the invasion of which by public officers for the enforcement of regulations would be resented. After considering the laws enforced in other countries, the commission recommends drastic legislation. The enactment of a law prohibiting the importation, sale or use of any paint material containing more than 5 per cent. of its dry weight of soluble lead compounds is the principal recommendation of the committee. Certain exemptions are provided for, such as those for artists' colors. In these cases, regulations insuring adequate precautions can easily be enforced. To give adequate time for paint makers and others to adapt themselves to new conditions, the committee recommends that the new legislation should not come into force for at least three years. Attention is drawn in the report to possible dangers from health arising from paint materials other than lead, such as turpentine or turpentine substitutes.

Medicolegal

Enjoining from Practicing Without License — Chiropractic — "Harmless" Treatments

(*Board of Medical Examiners vs. Freenor* (*Utah*), *154 Pac. R. 941*)

The Supreme Court of Utah affirms a judgment for the plaintiff, enjoining the defendant, a chiropractor, from practicing medicine within the state until he obtained a license. The court says that the first point sought to be made was that the alleged and found facts, if they constituted practicing medicine within the meaning of the statute, were criminal, and not invasions of property rights, and that equity would not lend its aid by injunction to restrain mere violations of public or penal statutes, except so far as it might be incidental to its enforcement of property rights or other matters of equitable cognizance. But Sectioon 1737 of the Compiled Laws of Utah of 1907 provides that any person practicing medicine, surgery or obstetrics within the state contrary to law may, at the instance of the board of medical examiners, be enjoined therefrom by the district court, until he shall have been by said board lawfully admitted to practice; and, unless prevented by some constitutional provision, which was not claimed, the court thinks the legislature had the power to change, abolish or enact rules of equity, and hence it is of the opinion that the court, by reason of the statute, had jurisdiction to proceed as it did.

Taking up the question of whether or not the defendant practiced medicine within the meaning of the statute, the court says that the statute is not restricted to prescribing, giving, administering or applying drugs, medicine or other agency or remedy. It is broad and unrestricted, and by its language was intended to be so. The defendant's statements that he did not "diagnose any disease" or "the patient," that "he had nothing to do with the diseased part," and that all he did was "to look at the spine and vertebrae—analyze the spine—to ascertain whether there was any displacement or subluxation or any other abnormal condition of the vertebrae," and "whether there was pressure or an impingement of the nerves, or an interference with vital energy or force, or a hindrance of the normal flow of life energy producing the disease," were mere evasions and confusions of what, in fact, was diagnosis to ascertain the cause of the disease or ailment. So were his statements, "I don't treat the sick or ailing; I merely adjust their spine," etc. It is difficult to understand how removing, or attempting to remove, the cause of an ailment is not treating, or attempting to treat, the ailment itself. Whatever merits or demerits the system of chiropractic may have, it is but egotism to assert that it is the only system which seeks to ascertain and remove causes of disease or ailments, and on that ground to claim it distinguishable from all other systems of treatment.

It was said that, if such a system as practiced by the defendant did no good, it did no harm, and that it was unlike administering powerful drugs or performing surgical operations from which ill consequences may follow unless in the hands of the skilful. However, that his treatments might be harmless would be no reason to permit him to violate the law. The statute does not say that one may operate on or treat an ailment of another so long as he does him no harm or shall not make him worse. But this oft-repeated statement does not bear scrutiny. Much harm may come to one afflicted with an ailment and seeking professional advice or aid from one incompetent to give it. There are many ailments in their acute stages which, if correctly diagnosed and properly treated, yield most readily, but, if not recognized and not properly treated, become, in their chronic stages, most stubborn and unyielding. It needs no argument to show the harm that may result by one without knowledge of

ophthalmology attempting to treat some acute and virulent disease of the eye by attributing the cause of the disease to a subluxed vertebra of the neck causing "nerve pressure," not that the manipulation to reduce the pretended subluxation might itself do harm, but that in the meantime the disease, for want of recognition and proper attention, may have progressed to a stage where it no longer can be arrested.

Insanity from Drugs as Defense to Crime—Effect of Prescription

(Perkins vs. United States (U. S.), 228 Fed. R. 408)

The United States Circuit Court of Appeals, Fourth Circuit, in reversing a conviction of manslaughter, says that the chief rules of law applicable to the case were these: 1. Insanity, to be available as a defense, must reach the degree of failure to understand the difference between right and wrong. 2. Drunkenness is not an excuse for crime, but the long-continued use of alcohol or other drugs, even though voluntary, may produce delirium tremens, or other mental derangement violent enough to amount to insanity, and make its victim not responsible under the law. 3. Intoxication, or delirium, from a drug used with knowledge that it is likely to produce intoxication or delirium obviously stands on the same footing as intoxication from alcohol. 4. A patient is not presumed to know that a physician's prescription may produce a dangerous frenzy. But he is bound to take notice of the warning appearing on a prescription, and this obligation is, of course, stronger if he reads the prescription. If, for example, in this case, the prescription itself, or the realized effect of the first dose of the chloral, or both together, warned the defendant before he had lost control of himself that he might be thrown into an uncontrollable frenzy, then he would be guilty of murder or manslaughter according to the view the jury might take of the circumstances. If, on the other hand, the defendant had good reason to infer from the terms of the prescription or the oral instructions of the physician, or from the effect of the first dose, or from all these together, that he would fall into unconsciousness from a larger dose, then he would not be legally responsible for acts committed in a violent frenzy which he had no reason to anticipate. If he was so frenzied by a portion of the medicine innocently taken under the direction of the physician that he was thrown into a mental state which placed him beyond his own control and beyond the realization of what might be the ill effect of an overdose, he would not be legally responsible. In this case it appeared that the defendant, on a voyage from New York to Charleston, killed another passenger. Before starting on the trip, he consulted a physician, who, fearing that he was on the verge of delirium tremens, prescribed phenacetin and caffein citrate for his headache, with the direction that if one powder failed to relieve, it was to be repeated in four hours, and, as a sedative for his nervousness, 2 ounces of chloral hydrate in solution, 1 teaspoonful, containing 15 grains, to be taken every six hours, to be stopped after three doses. It is not correct to say, as a general proposition, that a man without expert knowledge is presumed to know the effect of chloral, or of other drugs, if he knows what it is, that is, what it is made of. In such an instruction, however, there was no harmful error in this case, because the defendant had express warning from the physician's prescription not to take more than a certain quantity. He knew it was a drug that would affect the nerves, and he was notified by the terms of the prescription that serious results would follow an overdose. Unless the dose, taken in good faith under the physician's prescription, threw him into a state of uncontrollable delirium, he could not be allowed to take the risk of an overdose and visit the consequences on his fellow passengers. A distinction broadly made, as it was in this case, between insanity produced by disease coming as an act of God and that produced by a man's own voluntary act is not sound, for real mental disease amounting to insanity, as distinguished from ordinary intoxication, excuses, even when brought about by voluntary dissipation or other vice. Something of the lower court's views is to be found in the report in THE JOURNAL, Sept. 18, 1915, p. 1053.

Society Proceedings

THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS

Third Annual Meeting, held in Washington, D. C., May 11-12, 1916

(Concluded from page 149)

Localization of a Streptococcus in Animals from a Case of Recurring Neuritis and Myositis

DR. EDWARD C. ROSENOW, Rochester, Minn.: A streptococcus having peculiar properties was isolated from the dead pulp of the left upper first molar in the region where the attacks of pain usually began. The streptococcus was also demonstrated in the sections and isolated from the infiltrated deep fascia and muscles of the left side of the neck. A similar streptococcus was isolated from the pharynx and stool. This streptococcus was found to have elective affinity for the pulp of teeth, dental nerves and muscles of animals. It was repeatedly isolated from and demonstrated in the experimental lesions in animals whose blood was sterile; the lesions were again produced on reinjection, and the streptococcus again isolated. Many animals appeared to be in pain, and one rabbit had marked pain and tenderness over the left upper jaw. This affinity was proved to be absent in the diphtheroid and *Bacillus fusiformis* also isolated from the pulp of the tooth, and in the streptococcus broth culture filtrate. Streptococci from other sources rarely cause lesions in the pulp of teeth and dental nerves. The phagocytic power of the patient's blood following the attack over the strain from the tooth was twice that of comparable normal blood. These results would appear to warrant one in drawing the conclusion that the attacks of pain in the face in this patient were due to a streptococcus infection of the sheaths of the dental nerves, and that the pain, swelling, and tenderness and spasm of the muscles of the neck were due to myositis and fibrositis, the result of infection by this streptococcus. The demonstration of living streptococci in the pulp of the tooth and in the fascia and muscle during quiescent periods is significant and may explain the recurrence of the attacks. The cavity in the tooth, judging from the character of the filling and the bacterial flora, was unable to heal for mechanical reasons. This appeared to afford a culture medium for the growth of the streptococcus. From stimulation of the defensive mechanism in the patient during the attacks, active growth appeared to be held in check and the symptoms disappeared in consequence, only to reappear later from recurrence of active growth and localization of the streptococci when the immunity was low. The improvement in the patient since the extraction of the tooth appears to be due to the removal of this focus and to prolonged artificial stimulation of the defensive mechanism by means of autogenous vaccines, which it is hoped will lead to the destruction of all the streptococci in the muscle and dental nerves, and result in the ultimate recovery of the patient.

Analysis of Cases Changing to Wassermann Positive After a Wassermann Negative Period of Twelve Months or Over

DR. LOUIS A. LEVISON, Toledo: An analysis of the results of the Wassermann tests in sixteen cases shows that a negative Wassermann, even though obtained over a considerable period of time, cannot be considered as a criterion of cure. All the cases were late or advanced when they received competent treatment. They received mercury either in small and inefficient amounts, some not at all, at the time when treatment could have been of value. Many cases coming under my observation which have been treated intensively from the very start with salvarsan and mercurial injections have gone over one year with negative Wassermanns, and this group stands in sharp contrast to this series of late cases. It may be said, then, that a long continued negative Wassermann period in an early case that has been treated well from the beginning is a much better criterion of cure or permanent arrest than a similar Wassermann negative period occurring in a late or advanced case.

Diagnosis and Treatment of Septicemia

DR. EMIL ABDERHALDEN (Translated from the German by Dr. Oscar Berghausen, Cincinnati): We have made blood cultures in fifty cases having symptoms resembling clinically septicemia. Of these, 57 per cent. were positive, the streptococcus being the prevailing organism. Of twenty-three patients with a positive blood culture, 74 per cent. died and 26 per cent. recovered. Of seventeen patients with a negative blood culture, 35 per cent. died and 65 per cent. recovered. Ordinarily in this series a low white count indicated a bad prognosis. The differential white count is of the greatest importance. When the polymorphonuclear count approaches 90 per cent., particularly when the white count is low, the prognosis becomes grave. In most of these cases the antistreptococcic serums obtainable on the market were employed; in none was a cure reported. In thirteen of the cases, autogenous vaccines were employed in addition to the regular symptomatic treatment, and of this number seven recovered. These patients should be given plenty of fresh air and should be fed as liberally as possible without deranging the digestion. The hot pack is indicated in septicemia marked by high temperature and erythema, and in the absence of more serious complications, with stimulation before and after the pack. Digitalis may be employed to enforce the heart's action in the beginning, though we cannot thereby prevent the onset of endocarditis. Of the antipyretics, quinin is the most important and should be used in small doses and often. Apparently good results have been obtained by hypodermoclysis. The continued use of autogenous vaccines is justified. Spinal puncture is indicated when symptoms of meningismus develop.

Treatment of Pulmonary Tuberculosis by Tuberculin

DR. A. N. SINCLAIR, Honolulu, H. I.: No attempt has been made by us to classify the cases, because as soon as classification is attempted, considerable opportunity for error is offered. Out of 309 cases in which no tuberculin was used, 27.2 per cent. of all cases treated either were arrested, or the patients were able to return to their former occupations; while out of 506 cases treated with tuberculin, 50.1 per cent. of the patients were enabled to resume their former occupations. Another proof of the value of tuberculin is the almost immediate and continuous improvement that has occurred in many cases in which the patients did not receive treatment at Leahi Home but who were given tuberculin treatment. Failure in the use of tuberculin may rest on three factors: on the tuberculin itself; on the dosage, and on the selection of unfavorable cases. The dosage should be regulated, not by the "rule on the bottle method," but by the immunizing method. The production of antibodies to the tubercle bacilli is accomplished more safely and just as certainly by continued small doses as by large ones. I never go above 1/300 and rarely above 1/500 mg.

Value of Tuberculin in the Treatment of Tuberculous Lymphnoditis

DR. GEORGE P. SANBORN, Boston: In lymph node tuberculosis, tuberculin is particularly indicated for its specific effect as a stimulus to the formation of antibodies which the immunizing mechanism appears to lack in this form of tuberculosis. At the Boston City Hospital, all cases receive inoculations of tuberculin bacillus emulsion. The initial dosage in children is from 1/50,000 to 1/25,000 mg.; in adults, from 1/20,000 to 1/10,000 mg. Both human and bovine tuberculin is used. The increase in dosage was gradual. Constitutional reactions are avoided as far as possible. The patients' condition of living is practically the same during the treatment as during the period when the lymph nodes are developing. In 83 per cent. of the cases there was a diminution in the size of the nodes; one or more nodes broke down in 33⅓ per cent.; one or more nodes developed during treatment in 20 per cent.; surgical procedures were necessary in 11 per cent.; there was a gain in weight in 60 per cent. of the cases. There has been a demonstrable improvement in at least 83⅓ per cent. of the cases treated. Recurrence took place in eight cases.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

July, XII, No. 1, pp. 1-108

1 *Reliability of Electrical Diagnosis of Tetany. J. B. Holmes, Baltimore.
2 *Electrocardiographic Studies of Congenital Heart Disease. H. McCulloch, Washington, D. C.
3 *Diphtheria in First Year of Life. J. D. Rolleston, London.
4 Metabolism Study of Case of Diabetes Insipidus. J. Rosenbloom and H. T. Price, Pittsburgh.
5 *Etiology of Chorea. J. L. Morse and C. Floyd, Boston.
6 Curved Lines of Suction. M. Kasahara, Japan.

1. **Diagnosis of Tetany.**—The appearance of cathodal opening contractions under 5 ma. (and in the absence of certain conditions already mentioned) in children under 5 years of age Holmes claims is pathognomonic of tetany. Cathodal opening contractions are, however, not infrequently absent in cases of clinical tetany. The appearance of anodal opening contractions with less current than that causing anodal closing contractions, and under 5 ma. during the first six months of life is probably pathognomonic of tetany in all cases; their appearance with less current than that causing anodal closing contractions and under 2 ma. is probably pathognomonic up to the fourth or fifth year; thereafter it is of little significance. The appearance of a Chvostek phenomenon under 2 years, in the absence of birth trauma, indicates tetany; under 4 or 5 years of age it is highly suggestive of tetany; its appearance in the highest grade (Grade 3, Escherich) is suggestive throughout childhood. After 3 years the Chvostek phenomenon is not infrequently found in milder grades in apparently normal children. The occurrence of any one of these symptoms in association with a clinical history of tetany is to be considered conclusive evidence of tetany. The determination of the electrical values is an extremely useful, but not always an infallible, means of diagnosticating active or latent tetany in childhood. It is most useful in infancy. Like other clinical tests, this one has definite limitations that must be recognized.

2. **Congenital Heart Disease.**—Twelve cases of congenital malformation of the heart, from which electrocardiograms were obtained by McCulloch, he says, are confirmatory of the relation between right ventricular preponderance and the type of curve mentioned by Einthoven, in which there is a small R wave and a deep S wave in Lead I and a large R wave and a small S wave in Lead III. They also show that this type of curve is not diagnostic of a congenital malformation, as has been supposed, and that all congenital malformations do not show this type of electrocardiogram. That is, if the congenital malformation is of such a nature that a right ventricular hypertrophy results, one will obtain this type of a curve. If the malformation is not associated with this secondary hypertrophy, this type of electrocardiogram fails. McCulloch also studied four cases of pulmonary stenosis, five cases of defects of the interauricular or interventricular septums, two cases of patent ductus arteriosus, and one case of right ventricular atrophy.

3. **Diphtheria.**—This paper is based on a study of 2,600 consecutive cases of diphtheria seen by Rolleston in the course of the last twelve years. Of these, only twenty patients, or less than 1 per cent., were in the first year of life. Nearly twice as many occurred during the second half as during the first six months of the year. Particularly remarkable is the high percentage of cases with nasal involvement. Whereas of the total 2,600 only 668, or 25.6 per cent., showed any localization of diphtheria in the nose, thirteen cases, or 65 per cent., of the infants under 1 year showed nasal diphtheria either alone or in association with other diphtheritic lesions elsewhere. On the other hand, the disease was by no means confined to the nose, even in some of the youngest infants, as an equal number of children showed some faucial membrane. The unusual frequency of cutaneous diphtheria is also striking, namely, 15 per cent., as compared with 1.1 per cent. in the total 2,600 cases. In two cases the skin in the immediate neighborhood of the

mouth or nostril was affected, and in one, the labium majus and skin around the anus. In only four was the larynx affected, in three of whom faucial membrane was also present. One required tracheotomy and died, the other three recovered. In only three out of the twenty cases could the source of infection be detected. Three patients showed unmistakable signs of congenital syphilis. None of the cases had immediately followed measles. The incidence of paralysis among the 2,600 patients of all ages was 19.8 per cent. On the other hand, bronchopneumonia, which was noted in only 1.2 per cent. of the patients of all ages, occurred in six of the twenty cases, or 30 per cent., five of which terminated fatally. The high mortality in the twenty cases—nine deaths, or 45 per cent.—was thus mainly due to bronchopneumonia, which caused five deaths; cardiac paralysis, responsible for two deaths, and congenital syphilis for two.

5. **Etiology of Chorea.**—Twenty-six children, eleven boys and fifteen girls, were studied by Morse and Floyd, their ages varying between 3 and 11 years. One of the children died of chorea and several had a very severe type of the disease, but the course was mild or moderate in the remainder. Lumbar puncture was done twenty times in nineteen of the cases. The cerebrospinal fluid was perfectly clear in every instance. The pressure was apparently slightly increased in one instance. It was normal in all the others. A fibrin clot was never formed. The number of cells per cubic centimeter was counted in ten cases, and was, respectively, 2, 5, 7, 8, 10, 10, 10, 18, 24 and 25. There was, therefore, a slight increase in the number of cells in three of the ten cases, or 30 per cent. The cells were all mononuclear in every case. Lumbar puncture had no noticeable effect on the symptoms, either for better or worse, at the time or later, in any instance. The investigations made by the authors show that syphilis plays no direct part in the etiology of chorea. The results suggest that a micro-organism or a group of micro-organisms may be the cause of chorea. They seem to show that if chorea is caused by a micro-organism, the source of infection is ordinarily in the tonsils or teeth. They tend to confirm the belief that there is an intimate relation between chorea, rheumatism and endocarditis.

American Journal of Orthopedic Surgery, Boston

June, XIV, No. 6, pp. 319-380

7 Subastragalar Arthrodesis in Lateral Deformities of Paralytic Feet. D. P. Willard, Philadelphia.
8 Intraperitoneal Inoculation of Animals; Its Diagnostic Value in Orthopedic Surgery. M. S. Henderson, Rochester, Minn.
9 Present Methods in Treatment of Infantile Paralysis. H. W. Orr, Lincoln, Neb.
10 Critique of Causes and Treatment of Perthes' Disease (Osteochondritis Deformans Juvenilis). F. C. Kidner, Detroit.
11 Case of Multiple Cartilaginous Exostoses. H. W. Marshall, Boston.

American Journal of Roentgenology New York

June, III, No. 6, pp. 293-350

12 Roentgen Ray Idiosyncrasy. G. M. Mackee, New York.
13 Physical Aspect of Roentgen Ray Measurement and Dosage. J. S. Shearer, Ithaca.
14 Value of Lateral View of Hip. P. M. Hickey, Detroit.
15 *Cause and Prevention of Constitutional Effects Associated with Massive Doses of Deep Roentgentherapy. G. E. Pfahler, Philadelphia.
16 Roentgen Observations on Duodenum with Special Reference to Lesions Beyond First Portion. J. T. Case, Battle Creek, Mich.
17 Case of Osteosarcoma of Head of Femur. J. C. Hubbard and A. W. George, Boston.
18 Two Cases of Ureteral Calculus Presenting Unusual Symptoms Undiagnosed for Long Time. G. E. Pfahler, Philadelphia.
19 Convenient Method of Marking and Mounting Dental Films. A. R. Metz, Chicago.
20 Left Sided Appendicitis. J. T. Case, Battle Creek, Mich.
21 Warts as Source of Error in Search for Calculi. J. T. Case, Battle Creek, Mich.

15. Abstracted in THE JOURNAL, Nov. 6, 1915, p. 1670.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans

June, III, No. 12, pp. 625-664

22 *Employment of Rat Poison as Measure for Preventing and Exterminating Plague. T. Kitano.

22. Rat Poison in Exterminating Plague.—When the plague has appeared in different ports of Japan, rat poison has often been employed with varied success, but the manner in which this has been done in Yokohama, that is, continued distributions of large quantities of the poison to every house throughout the whole city, and especially the use of phosphorus poison, has never been tried anywhere before. Kitano reports the details of this work. His conclusions are as follows: The use of phosphorus in the preparation of rat poison is the most effective. The effect of the arsenic rat poison, if the material be changed with the seasons and the taste of rats, is next to phosphorus rat poison. Sulphonal and calcium sulphate are not perfect in their effect for rat poison. If plague ridden rats eat these rat poisons they die so soon that the bacteria cannot widely spread. The effect of the phosphorus rat poison lasts more than twenty days, the arsenic rat poison lasts more than that. The distribution of this rat poison when compared with other preventive measures is simple and economical and it does not interfere with commercial and industrial enterprises. The more widely this rat poison is distributed to every house the better are the results. Kitano found no rat in the localities in which rat poisons were distributed several times to every house therein. The cleansing and disinfection of the houses is quite needless after the distribution of the rat poisons. As a means of preventing the plague the employment of rat poison is superior to any other measure. In Yokohama the plague was entirely stamped out within six months. The phosphorus used was soaked into bread and cut into pieces, containing 0.025 gm. of phosphorus per piece.

Boston Medical and Surgical Journal

June 29, CLXXII, No. 26, pp. 925-970

23 *Etiology of Diseases of Circulatory System. T. C. Janeway, Baltimore.
24 Respiratory Exchange, with Description of Respiration Apparatus for Clinical Use. F. G. Benedict and E. H. Tompkins, Boston.
25 *Diagnosis of Periosteal Sarcoma with Roentgen Ray. F. J. Cotton, Boston.
26 Further Experience in Treatment of Intracranial Hemorrhage in Newborn. R. M. Green, Boston.

23. Diseases of Circulatory System.—Janeway urges (1) the education of the public to consider "rheumatism" a serious disease, particularly in childhood, and to seek competent medical advice at once; and the education of the medical profession to treat even the mildest rheumatic fever in bed with large doses of salicylates from the earliest possible moment; (2) the provision of convalescent hospitals for the necessarily protracted after-care of cases of acute inflammatory disease of the heart and of patients recovering from myocardial insufficiency; (3) the development of suitable employments for cardiac patients, and of the social and economic machinery necessary to placing them in such employments, and (4) general hygienic measures, including the promotion of temperance.

25. Diagnosis of Periosteal Sarcoma with Roentgen Ray.—A case of bone thickening, showing in the roentgenogram a picture of slight cortical erosion only, the presence of light stalactite-like threads of bone, perpendicular to the bone surface, strongly suggests sarcoma.

Bulletin of Medical and Chirurgical Faculty of Maryland, Baltimore

June, VIII, No. 12, pp. 225-245

27 Dispensary Abuse and Certain Problems of Medical Practice. J. W. Williams, Baltimore.

Canadian Medical Association Journal, Toronto

June, VI, No. 6, pp. 481-576

28 Ontario Medical Association. H. B. Anderson, Ontario.
29 Acute Mammary Carcinoma. G. E. Learmonth, High River, Alberta.
30 Suppurative Otitis Media. E. H. White, Montreal.

Cleveland Medical Journal

May, XV, No. 5, pp. 315-376

31 Occupational Mortality Experience of 94,269 Industrial Workers—Metropolitan Life Insurance Company, 1911-1913. L. I. Dublin, New York.
32 Some Medical and Surgical Fallacies Concerning Gastro-Intestinal Derangements. N. Rosewater, Cleveland.*

Iowa State Medical Society Journal, Des Moines

June, VI, No. 6, pp. 241-280

33 Experience in Medical Cooperation. W. B. Small, Waterloo.
34 Bacteriology of Throat Infections. F. J. Hall, Kansas City, Mo.

35 Health of Women Students in Some of Iowa Colleges. J. F. Throckmorton, Chariton.
36 Use of Lane's Plates in Treatment of Fractures of Femur. F. M. Tombaugh, Burlington.
37 Eczema. E. L. McEwen, Chicago.
38 Chronic Pancreatitis. J. W. Shuman, Sioux City.
39 Early Diagnosis of Cancer of Uterus. G. T. McCauliff, Webster City.

Journal of Infectious Diseases, Chicago

July, XIX, No. 1, pp. 1-103

40 Study of Various Methods for Determining Virulence of Diphtheria Bacilli. J. A. Kolmer and E. L. Moshage, Philadelphia.
41 *Study of Acid Production by Diphtheria Bacilli. E. L. Moshage and J. A. Kolmer, Philadelphia.
42 *Relation of Carbohydrate Splitting Ferments to Soluble Toxins of Diphtheria Bacilli. J. A. Kolmer and E. L. Moshage, Philadelphia.
43 Protein Sparing Action of Utilizable Carbohydrates in Cultures of Certain Sugar Fermenting Organisms. H. M. Jones, Chicago.
44 Antigenic Value of Spirochaeta Hyos in Complement Fixation Tests in Hog Cholera Serum. W. E. King and R. H. Drake, Detroit.
45 *Production of Antibodies After Antityphoid Inoculation. K. Howell, Chicago.
46 *Effect of Benzene on Production of Antibodies. L. Hektoen, Chicago.
47 *Time Relations of Infiltrating Cells in Acute Anterior Poliomyelitis. A. E. Taft, Boston.
48 *Yeasts, Probably Pathogenic in Throat Cultures. A. L. Grover, Iowa City, Iowa.
49 *Phagocytosis and Leukocytic Activity in Diphtheria Carriers. R. Tunnicliff, Chicago.

41. Acid Production by Diphtheria Bacilli.—In the experience of Moshage and Kolmer acid production tests are of limited value in the classification of diphtheria bacilli. From the practical standpoint, these tests have generally proved successful in the identification and classification of the Hofmann bacillus on the basis that it does not produce appreciable quantities of acids with carbohydrates. For the purpose of differentiating between virulent and nonvirulent bacilli, these tests have failed to prove of any value; the typical virulent diphtheria bacillus produces acids most characteristically with dextrose, dextrin, levulose, and galactose, and the false types, or Hofmann's bacilli, produce no acids at all; but between these extremes is a large group of bacilli of varying morphology and from different sources which present varying and inconstant degrees of virulence and fermentative power.

42. Carbohydrate Fermentation and Soluble Toxins.—According to Kolmer and Moshage carbohydrate fermentation by diphtheria bacilli is dependent on secretory enzymic products of the diphtheria bacillus, but is independent of the soluble poison or toxin; these ferment like carbohydrate splitting products are most likely to be produced by toxin producing bacilli.

45. Antibodies After Antityphoid Inoculation.—After injection of typhoid vaccine into human beings specific antibodies develop in the blood. Howell found that they reach the highest concentration in from one to two months, after which they gradually diminish. Opsonin appears to develop earliest. Agglutinin, so far as known now, persists the longest, having been demonstrated to be present two years and even longer after the vaccination. Specific complement fixation is obtainable with the serum of persons injected with typhoid vaccine, hence this test is not distinctive of typhoid.

46. Benzene and Production of Antibodies.—The course of infection and the production of antibodies in animals under the influence of benzene was investigated by Hektoen. He found that in rabbits the repeated injection of benzene in doses of 1 c.c. per kilo of rabbit weight at about the same time that sheep blood is injected greatly reduces the production of specific precipitin and lysin. In considerably larger doses benzene has a like effect on the production of lysin in white rats. The reduction of antibody formation under these circumstances is associated with grave lesions in the marrow, with leukopenia, and other changes characteristic of benzene intoxication, the leukocytes in the rabbit being of reduced phagocytic power. In the dog, benzene (0.02 c.c. per kilo) may cause leukocytosis associated with increase in production of lysin for goat corpuscles. So far as can be determined by the precipitin method, the course of the antigen in the blood appears the same in benzenized as in nonbenzenized rabbits. At the height of antibody production the injection of benzene appears to have but little effect on the leukocytes of the blood and on its antibody content, the precipitin especially persisting longer and with more fluctuation than otherwise. Benzene may lower the resistance to infection by reduction (1) of antibody production, (2) of the number of leukocytes and (3) of leukocytic activity. That benzene acts on elements that elaborate antibodies and that the leukocytogenic centers are concerned in this elaboration is indicated (*a*) in the rabbit, by the reduction of antibodies and of leukocytes and by the resistance to these effects when antibody production is at or near its highest activity as measured by the concentration of antibodies in the blood, and (*b*) in the dog, when suitable doses are given, by leukocytosis and increased formation of lysin.

47. Infiltrating Cells in Poliomyelitis.—Thirty-eight cases, all in monkeys, were examined by Taft. Cases with a short incubation period and brief duration before death, showed a corresponding abundance of polymorphonuclear cells in the pericellular infiltrate, and an extreme degeneration of anterior-horn nerve cells. Cases in which death was delayed weeks or months showed a persistence of small round cell infiltration, but no polymorphonuclear leukocytes, even in cases with extreme nerve cell destruction. Therefore, Taft concludes that the duration of the disease, the incubation period, and the cell degeneration in acute anterior poliomyelitis, apparently depend on the virulence of the infecting virus. The polymorphonuclear leukocytes disappear after a time (in the cases here considered apparently within three weeks), but the small mononuclear cells, when death is sufficiently delayed, persist.

48. Yeasts in Throat Cultures.—Yeasts are found in the throats of a certain percentage of all individuals, and that under proper conditions they become pathogenic, setting up either an inflammation of the mucous membranes of the throat and air passages, or else producing a more deeply seated infection, such as a tonsillar or peritonsillar abscess. Experimentally, most of these organisms appear to be pathogenic for guinea-pigs. From a study of the clinical histories, Grover believes them to be pathogenic for man. The cultural characteristics of the organisms recovered from throat cultures have been worked out in considerable detail, but as yet no specific classification has been attempted.

49. Phagocytosis and Leukocytic Activity.—A study of diphtheria patients and carriers made by Tunnicliff showed that the phagocytic power of the blood of diphtheria carriers is increased, but at the same time the nose and throat may contain large numbers of leukocytes not engaged in phagocytosis. Efforts to increase the activity of these leukocytes by the use of normal serum, leukocytic suspensions, calcium chlorid, sodium salicylate, lactic acid, and magnesium chlorid were unsuccessful, although dilute solutions of these substances are found to promote phagocytosis in the test tube.

Journal of Nervous and Mental Disease, Lancaster, Pa.

June, XLIII, No. 6, pp. 489-590

50 *Study of Condition Occurring in Aged Usually Attributed to Cerebral Arteriosclerosis. C. M. Byrnes, Baltimore.
51 *Tumor Involving Crus Cerebri (With Unusual Endocrine Symptoms). W. Timme, New York.
52 Tic of Abdominal Muscles of Thirteen Years' Duration, Study of Case with Necropsy. F. B. Clarke, Milwaukee, Wis.
53 Interpretation of Symptoms in Infective Exhaustive Psychoses. S. Brown II, Bloomingdale, Ill.
54 *Pathologic Findings in Two Cases of Paralysis Agitans. E. M. Auer and G. P. McCough, Philadelphia.

50. Study of Condition Occurring in Aged.—Although the histologic examination of the cerebral vessels of the four cases examined by Byrnes does not confirm the clinical diagnosis of cerebral arteriosclerosis, there were other important pathologic changes which Byrnes believes may explain some of the symptoms. There were marked changes in the peripheral vessels, chronic interstitial nephritis, anemia, moderate local meningeal infiltration, and disintegration of the Purkinje cells, the cells of the nucleus dorsalis and the anterior horn cells of the spinal cord. The author suggests that it is not improbable that the symptoms may have been due to uremic or syphilitic toxemia, extracranial arteriosclc-

rosis, or spasmodic constriction of the peripheral or cerebral vessels.

51. **Tumor Involving Crus Cerebri.**—The status of Timme's patient (male, aged 14, in July) was as follows: A staggering, swaying gait toward the left side chiefly, but also occasionally to the right; occipital headache; nausea. There was a right facial weakness seen chiefly in smiling. Diplopia was present. Nystagmus, coarse in character, greater when looking to the left, with the slow component to the right, was constant. Vision $^{20}/_{30}$ each; hyperopia; with white and red fields normal. Disks were pink, veins slightly dilated. In October a beginning papilledema with hemorrhage was first noticed in both fundi with normal color fields. There was incoordination with ataxia of hands and feet; right greater than left. The reflexes gave a greater right knee jerk, a double Babinski and Oppenheim, greater on the right, doubtful on the left at times; abdominals, right sluggish, left absent, epigastrics likewise; cremasterics equal. Elbow jerk, right exaggerated, left doubtful; asynergia was well marked in the usual movements of equilibration. Hearing unaffected. Weber and Rinne tests showed normal conduction. There was irregular pointing by and adiadochokinesis of the right hand. The cerebrospinal fluid was negative. The penis and scrotum were unduly developed. A roentgenogram of the skull showed no abnormal sella turcica, nor other pathologic condition. From these findings a general diagnosis of tumor was made without special localization. The drowsiness and headaches became more marked. He had two unilateral convulsions involving the right side. Following them there was added an Oppenheim on the left side and a gradual impairment of the motor functions of the trigeminus on the left side. Joint sense was unimpaired. Astereognosis was absolute on the right side. A moderate spasticity of the right leg began to appear but no clonus. Finally there was elicited by means of the esthesiometer, a slight diminution of cutaneous sensibility of the entire right side. These signs, together with the foregoing status, enabled Timme to localize the tumor as one involving the crus and pons of the left side, and extending posteriorly, to the origin of, but not including, the facial and auditory nerves—at any rate beyond the origin of the motor fifth.

The patient became progressively worse and died of respiratory paralysis. The necropsy showed a brain very much enlarged, the ventricles only slightly distended, with a pons very much distorted and enlarged, especially on the left side. This enlargement was caused by an extensive pontine tumor mass which reached forward through the left crus cerebri to the left thalamus, and posteriorly nearly to the beginning of the medulla, extending slightly into the brachium pontis of the left side; involving in this extended focus the left median fillet, the red nucleus with the emerging rubrospinal tract, the left brachium conjunctivum, the left motor fifth root, and compressing the pyramidal tract of the left side as well as by transmitted pressure that of the right side also in lesser degree. The hypophysis was normal in size. The pineal gland was roughly triangular in shape with a large transverse diameter of 12 mm. and its anteroposterior 10 mm. This represents a gland rather large in size although within normal variation. The tumor proved to be a glioma.

54. **Pathologic Findings in Paralysis Agitans.**—The pathologic changes noted in the region of the basal ganglia in the two cases studied by Auer and McCough were: 1. Areas of rarefaction containing neuroglia cells and debris giving the tissue a moth-eaten appearance. 2. Clean punched out holes possibly excessively enlarged perivascular spaces from which the vessels may have dropped out. 3. Round and oval basic staining deposits chiefly in the perivascular space and adjacent tissues. 4. Diminution in the number of the external medullary laminal and of the radial fibers of the lenticular nucleus with some evidence of degeneration of the latter. 5. Failure of the cells of the corpus striatum to stain well which latter may possibly have been due to the age of the material. 6. In one case advanced degeneration of the cells of the centrum medium on both sides and of the corpus subthalamicum.

Journal-Lancet, Minneapolis

June 15, XXXVI, No. 12, pp. 341-370

55 Case of Perforating Gastric Ulcer Following Gastro-Enterostomy. A. N. Collins, Duluth.

Kansas Medical Society Journal, Topeka

June, XVI, No. 6, pp. 161-190

56 History of Kansas Medical Society. O. D. Walker, Salina.
57 Etiology of Iritis. J. W. Kimberlin, Kansas City, Mo.
58 Who Shall Practice Medicine? W. H. Young, Fredonia.

Medical Record, New York

July 1, XC, No. 1, pp. 1-46

59 *Congenital and Acquired Hemolytic Icterus; Report of Two Cases Treated by Splenectomy. G. E. Brewer, New York.
60 Human Prostate in Middle Age. O. S. Lowsley, New York.
61 Frozen Limbs and Their Treatment in Present War. E. K. Tulhidge, Philadelphia.
62 Present Conception of Congenital Syphilis and Its Modern Diagnosis. A. Rostenberg, New York.
63 Importance of Blood Pressure to Eye Specialist. F. P. Hoover, Jacksonville, Fla.
64 Some Deformities of Head Mentioned in Talmud. D. I. Macht, Baltimore.

59. **Congenital and Acquired Hemolytic Icterus.**—Brewer reports two cases of splenomegalic hemolytic icterus, greatly improved if not cured by splenectomy. Both patients are free from jaundice, are much improved in health, and are able to do their work without fatigue. Brewer says that while there are as yet very few reports stating the remote results of splenectomy in these cases, the records so far as they go show conclusively that in early splenectomy we have a comparatively safe and the only successful method yet suggested in the treatment of splenomegalic hemolytic icterus.

New York Medical Journal

July 1, CIV, No. 1, pp. 1-38

65 Conservatism in Obstetrics. E. B. Cragin, New York.
66 Bone Sarcoma Treated by Radium. J. B. Bissell, New York.
67 Stricture of Ureter. G. L. Hunner, Baltimore.
68 Congenital Syphilis; Report of Case. J. P. Jones, Nez Perce Idaho.
69 Intradural Nerve Anastomosis in Selected Cases of Poliomyelitic Paralysis. N. Sharpe, New York.
70 Contents of Ovarian Cysts. J. T. Leary, H. J. Hertz and P. B. Hawk, Philadelphia.
71 Dementia Praecox. M. J. Karpas, New York.
72 Autoserotherapy. F. Huber, New York.
73 Clinical Significance of Gastric Analysis. L. W. Kohn, Philadelphia.

New York State Journal of Medicine

June, XVI, No. 6, pp. 279-330

74 Nauheim Method. S. Baruch, New York.
75 Scheme of State Control for Dependent Infants. H. D. Chapin, New York.
76 Cancer as Nonsurgical Disease. L. D. Bulkley, New York.
77 Relation of State to Saratoga Springs Reservation. C. S. Whitman, New York.

Ophthalmic Record, Chicago

June, XXV, No. 6, pp. 271-324

78 Experimental Comparison of Three Common Methods of Measuring Heterophoria. F. W. Weymouth, San Francisco.
79 Indirect Injuries of Choroid and Retina. L. Mills, Los Angeles.
80 Case of Symmetrical Lymphomata of Lacrimal and Salivary Glands (Mikulicz' Disease). W. C. Posey, Philadelphia.
81 Injuries to Eye From Broken Spectacle and Eyeglass Lenses. F. D. Vreeland, Chicago.
82 Additional Fixation of Eye, in Connection with Use of Lid Retractors in Standard Cataract Operations. D. W. Stevenson, Akron, Ohio.
83 Case of Choked Disk with Rapid Destruction of Sight and Subsequent Improvement. A. M. Dunlap, Shanghai, China.
84 Herpes of Cornea as Complication of Influenza; Report of Case. C. W. Walker, York, Neb.

Public Health Journal, Toronto

June, VII, No. 6, pp. 289-333

85 Sewage Disposal by Activated Sludge Process. T. C. Hatton.
86 Ontario Medical Association Presidential Address. H. B. Anderson.
87 Married Woman in Industry. J. Martin.
88 Periodic Medical Examination. G. Elliot, Toronto.
89 Antityphoid Inoculation in Soldiers. G. D. Porter.
90 School Care of Girls During Puberty. R. I. Warner, St. Thomas.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

June, XXIV, No. 6, pp. 161-192

91 Nervous Disorders Associated with Pelvic Disorders. G. H. Moody, San Antonio, Texas.
92 Management of Pellagra and Its Treatment. W. T. Wilson, Navasota, Texas.

93 Newer Methods for Treatment of Gonorrhea. R. Boland, Oklahoma City.
94 Syphilis, Stomach and Pancreas. A. W. White, Oklahoma City.
95 Value of Functional Kidney Tests Prior to Operation on Urogenital Organs. J. Fischer, Kansas City, Mo.
96 Diagnosis and Treatment of Pellagra. J. L. Day, Norman.

Surgery, Gynecology and Obstetrics, Chicago

July, XXIII, No. 1, pp. 1-118

97 *Technic of Splenectomy. D. C. Balfour, Rochester, Minn.
98 *Etiology of Uterine Prolapse and Cystocele. G. Fitzgibbon, Dublin.
99 Transpancreatic Approach to Common Bile Duct. A. H. Harrigan, New York.
100 *Excision vs. Gastro-Enterostomy. V. B. Knott, Sioux City, Iowa.
101 *Advantage of Separate Suture of Mucous Membrane in Gastric Surgery. R. A. Barr, Nashville, Tenn.
102 *Melano-Epithelioma; Report of Seventy Cases. A. C. Broders and W. C. MacCarty, Rochester, Minn.
103 Cases of Giant Ureteral Calculus; Anomalous Development of Genito-Urinary Tract. I. Abell, Louisville, Ky.
104 Teratogenesis of Human Athoracic, Acephalic, Acardiac Triplet, with Numerous Ageneses. H. O. White, Los Angeles, Calif.
105 *Etiology of Cancer of Esophagus and Stomach. W. Lerche, St. Paul, Minn.
106 Rupture of Bladder Associated with Fracture of Pelvis; Report of One Case. E. P. Quain, Bismarck, N. D.
107 Pelvic Varicocele. J. A. Wall, Santiago, Chile.
108 Purpura Hemorrhagica Following Menorrhea. F. R. Benham, Syracuse.
109 Relation of Endometrium and Ovary to Hemorrhage from Myomatous Uteri. S. H. Geist. New York.
110 *Sarcoma of Scapula; Histologic Diagnosis Made by Study of Blood Aspirated from Pulsating Portion of Tumor. C. E. Royce, Iowa City, Iowa.
111 *Unilateral Hematuria Associated with Fibrosis and Multiple Microscopic Calculi of Renal Papillae. R. L. Payne, Jr., Norfolk, Va.
112 Process of Repair in Wounds of Small Intestine. J. E. McWhorter, A. P. Stout and C. C. Lieb, New York.
113 Value of Determination of Cholesterol Content of Blood in Diagnosis of Cholelithiasis. E. Henes, Jr., New York.
114 Surgical Replacement of Prolapsed Kidney. D. Bissell, New York.
115 Method for Preventing and Controlling Hemorrhage Following Prostatectomy. L. H. Cook, Bluffton, Ind.
116 Paint Brush Drainage Tube. A. M. Miller, Danville, Ill.

97. **Technic of Splenectomy.**—The features emphasized by Balfour in the technic of splenectomy are: (1) the abdominal exploration, (2) the dislocation of the spleen, (3) the use of a hot gauze pack, (4) the protection of stomach and pancreas from injury, (5) the preliminary ligation of adhesions and (6) the treatment of the splenic pedicle.

98. **Etiology of Uterine Prolapse.**—Prolapse of the uterus and cystocele, Fitzgibbon says, are due to damage of the pelvic fascia in the region of the lateral fornices and in front of the cervix. Laceration of the perineum and levator ani muscles has no part in the production of prolapse. The cure of the condition can be effected by reuniting the fascial diaphragm across the pelvis.

100. Abstracted in THE JOURNAL, January 22, p. 304.

101. Abstracted in THE JOURNAL, January 15, p. 215.

102. **Melano-Epithelioma.**—In the opinion of Broders and MacCarty the so-called "melanosarcoma" should be called properly a melano-epithelioma when such a condition arises in the skin. A study made of seventy cases showed that the condition arises as a migratory hyperplasia of the basal (regenerative or germinative) layer of the skin and invades the subcutaneous tissues and distant organs as pigmented and nonpigmented oval, spherical, or spindle cells, all of which cells are frequently found in the same specimen or even in the same microscopic slide. The evolution of such neoplasms in regenerative cells corresponds to the evolution of cancer in the skin, mammary gland, prostatic gland and stomach. The alveolar arrangement of cells in this series shows no evidence of any relation to vascular endothelium. There is no specific region of the skin which seems especially predisposed to the development of melano-epitheliomas unless it is on the lower extremities, which in this series form the greatest frequency of location. Nevi certainly predispose to the development of the condition. Metastasis is usually to the regional lymphatic glands. Melano-epitheliomas or melanosarcomas arising in the eye have a much better prognosis than melano-epitheliomas arising in the skin. From a therapeutic standpoint the pathologic history of melano-epithelioma clearly points to the necessity of an early diagnosis and a radical removal of the primary lesion and regional lymphatic glands. From a prophylactic standpoint pigmented areas of skin, such as warts and nevi, should be removed when these are in locations which are or have been subjected to injury.

105. **Etiology of Cancer of Esophagus and Stomach.**—Hot fluids so universally taken throughout the temperate climate zone, in the form of coffee, tea, soups, etc., and giving rise to chronic irritation, Lerche believes to be the main predisposing cause of cancer of the esophagus and stomach.

110. **Sarcoma of Scapula.**—A 10 c.c. of fluid had been aspirated from a tumor of the shoulder which was tentatively diagnosed as sarcoma. The fluid was allowed to stand over night at room temperature. The next morning it was clotted. A 10 per cent. formalin was added without disturbing the clot. The following day Royce removed a portion of the clot and imbedded it in paraffin. Sections from this block stained with hematoxylin and eosin presented beautiful pictures of islands of sarcoma cells imbedded in a matrix of fibrin and red cells. The cells are of the small round variety and mitotic figures are frequently seen.

111. Abstracted in THE JOURNAL, January 15, p. 215.

Wisconsin Medical Journal, Milwaukee

June, XV, No. 1, pp. 525-556

117 Some Precancer Conditions. W. E. Ground, Superior.
118 Bifurcation of Transverse Process of Fifth Lumbar Vertebra: Report of Case. W. Cunningham, Platteville.
119 Syphilis of Nervous System. F. C. Studley, Milwaukee.
120 Case Involving Differential Diagnosis Between Paresis and Manic Depressive Insanity (Expansive Form) in Syphilitic Subject. R. Dewey, Wauwatosa.
121 Health Supervision of Schoolchildren. G. P. Barth, Milwaukee.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

June 10, I, No. 2893, pp. 809-840

1 Malunited and Ununited Fractures. R. Jones.
2 Spirochaeta Eurygyrata, as Found in Human Feces. H. B. Fantham.
3 *Perforating and Penetrating Wounds of Chest With Severe Hemorrhage. A. Don.
4 Suction or Vacuum Bougie for Treatment of Chronic Gonorrhea. A. Cambell.

3. **Perforating Wounds of Chest.**—If one considers the mechanism and physics of respiration one finds that with each inspiration there is a lifting of the chest wall and depression of the diaphragm, which tends to produce a vacuum in the pleural space by a sucker-like effect. A bleeding point thus has a suction pump applied to its open rent, and a clot is prevented from forming. The same process of suction takes place also throughout the lung tissue, and there is added the elasticity of the lung itself, which pulls apart and keeps open any rent. To overcome both the suction and the elastic forces and to allow the lung a complete rest till hemorrhage has been arrested, Don proposes making a temporary opening into the pleural cavity, allowing the lung to contract quickly, and, if necessary, washing out the blood clot. The risk of causing an infection which would not otherwise occur is infinitesimal. Very severe hemorrhage could be treated in advanced stations of field ambulances, less severe ones more comfortably in the small hospitals of the field ambulance and others, a diminishing number in the casualty clearing stations. In the only case in which Don has done the operation great relief was experienced in breathing; there was a marked diminution of pain, and, though hemorrhage could not be said to have been severe, it was still going on, and stopped quickly after the operation.

The operation may be done under a general or a local anesthetic, and in any of the usual sites for empyema, preferably the mid-axillary line. Percussion localizes the hemothorax, and a stab is made with a scalpel through the intercostal space, close to the lower rib. The scalpel goes right into the pleural space. The outer covering of one of the army tracheotomy tubes is slipped easily, owing to its central groove, one half along each side of the blade of the knife,

and is pushed right home. The knife is then withdrawn and the center piece of the tracheotomy tube put in. If air has not entered during the previous manipulations it will do so now, with a hissing noise, and the blood will be coughed out. The hemothorax may be aspirated through a soft catheter placed inside the tracheotomy tube, as was done in Don's case, but this would not be necessary in cases treated earlier, when clotting would not have taken place. The tube is now turned so that the inside end points up, and is fixed by straps and plaster or a suture to the chest wall. A pad of sterile gauze and wool completes the dressing. The tube is removed after twenty-four or forty-eight hours, according to the amount of blood escaping. The wound closes immediately aseptically.

Dublin Journal of Medical Science

June, CXLI, No. 534, pp. 371-441

5 Enzymes. W. G. Smith.
6 Myelitis, With Special Reference to That Due to Trauma and New Growths. E. E. Lavy.

Edinburgh Medical Journal

June, XVI, No. 6, pp. 417-502

7 Case of Hemophilia. T. Y. Finlay and A. M. Drennan.
8 Case of Symmetrical Pressure Fibromata. D. M. Greig.

Indian Medical Gazette, Calcutta

May, LI, No. 5, pp. 161-200

9 German Influence on Modern Bacteriology — Need for Elimination and Revision. W. C. Hossack.
10 Correct Names of Helminths of Man. C. Lane.
11 Treatment of Kala-Azar With Special Reference to Use of Antimony and Formaldehyd. R. U. N. B. Bahadur.
12 Injuries to Peripheral Nerves. F. P. Connor.
13 Septic Wounds Affecting English and Indian Troops: Comparison. N. W. Mackworth.
14 Gunshot Wound of Foot. A. B. de Castro.

Medical Journal of Australia, Sydney

May 20, I, No. 21, pp. 411-428

15 Formaldehyd in Ether. E. H. Embley.
16 Oil Ether Anesthesia. L. Lambert and M. R. Hughes.

May 27, II, No. 22, pp. 429-446

17 Inflammation of Fallopian Tubes. W. T. Chenhall.
18 Case of Liver Abscess. D. A. Cameron.
19 Epidermolysis Bullosa. N. Paul.

Practitioner, London

June, XCVI, No. 6, pp. 573-664

20 *Vaccine Treatment of Asthma in Bengal. L. Rogers.
21 *Alternatives to Operation of Colotomy. J. S. McArdle.
22 Cereated Milk Feeding for Infants. F. J. Poynton.
23 Recent Progress in Gynecology. F. McCann.
24 Recent Work on Diseases of Heart. C. W. Chapman.
25 Tuberculosis Arrangements From Clinical Point of View. H. Yallow.
26 Diet in Treatment of Pulmonary Tuberculosis. D. C. Muthu.
27 Vicious Circles Associated With Disorders of Blood. J. B. Hurry.
28 Treatment of Scars. W. K. Sibley.
29 Transplantation of Flexor Carpi Radialis Into Extensors of Thumb and Fingers in Case of Musculospiral Paralysis. P. J. Byrne.
30 Case of Migratory Pneumonia Occurring in Lung Wounded by Shell Containing Shrapnel Bullet. S. H. Bennett.

20. **Vaccine Treatment of Asthma.**—Promising results have been obtained by Rogers in a number of cases of asthma by vaccine treatment. Cultures were made from freshly obtained sputum; subcultures were made from the fine pneumococcal and streptococcal-like colonies, a number of them being taken up so as to get as many strains as possible in the tubes used for making the vaccine. Occasionally the culture consisted so purely of fine colonies that the vaccine could be prepared from the primary culture, but this was exceptional. A solution of 5 c.c. of sterile salt were added to each tube, which were then heated to from 56 to 60 C. for one hour; one-half per cent. of phenol was added, and after mixing well, the fluid was put up in doses of ½ and 1 c.c. The first dose was ½ c.c., which usually contained somewhere about 50,000,000 organisms. If no febrile but only a little local reaction occurred, a dose of 1 c.c. was given after five days, and repeated weekly. Occasionally the dose was increased to 1½ or 2 c.c., but as a rule this was unnecessary.

21. **Colotomy Operation Alternatives.**—When there is a cancerous obstruction in the bowel at the edge of the true pelvis, with infiltration of the surrounding tissues, and resection is quite impossible, colotomy, with all its inconveniences, is the usual procedure now carried out. In McArdle's opinion, instead of colotomy, either of four operations should be carried out, according to the conditions found on exploration: 1. The sigmoid above the stricture can be joined to the sound lower part of the rectum, if the former is free enough. 2. If the sigmoid is fixed so that it cannot be brought down, the transverse colon, if low, may be anastomosed to the rectum and to the descending colon above the stricture. 3. When this is not feasible, the cecum may be joined to the rectum, and the ileum joined to the colon above the stricture. 4. The lowermost coil of the ileum may be joined to the rectum, and by a lateral anastomosis to the descending colon above the obstruction.

Bulletin de l'Académie de Médecine, Paris

May 30, LXXV, No. 22, pp. 647-670

31 *Syphilis Not a Factor in Appendicitis. (Sur l'intestin des héréditosyphilitiques.) Jalaguier, Routier and others.
32 Bacteriologic and Clinical Study of Infectious Sore Throat and Treatment of Different Types. (Angines. Sérothérapie de la diphthérie.) Capitan.
33 Indications for Resection of the Knee for Suppurating War Wounds. (Les indications de la résection du genou dans les arthrites suppurées par plaies de guerre.) L. Bérard.
34 *Duration of Immunity Conferred by Preventive Antitetanus Serum. (Durée de l'immunité conférée par les injections préventives de sérum antitétanique.) L. Bérard and A. Lumière.
35 Arteriovenous Aneurysms. (Sur les anévrismes traumatiques artério-veineux directs.) Soubbotitch.

31. **Sypnilis Not a Factor in Appendicitis.**—Jalaguier, Routier, and Monod declare that they have never found any changes suggesting syphilis as a pathogenic factor here, and they denounce Gaucher's statements that inherited or acquired syphilis is frequently at the basis of enterocolitis and appendicitis especially in infants and older children. (See also Paris Letter in THE JOURNAL July 8, 1916, p. 132.)

34. **Duration of Protection from Antitetanus Serum.**—Bérard and Lumière know of over twenty cases of tetanus developing in wounded requiring some late operation, after the protection afforded by the prophylactic serotherapy had subsided. Roux's experiences with animals indicate that the protection begins to decline the fifteenth day and is quite gone by the fortieth or fiftieth day. In man, twenty or thirty days is regarded as the limit after two injections of 10 c.c. each. In four cases described in detail the tetanus developed after an operation to extract a fragment of shell only seven or eight days after the wound and prophylactic injection. Hence they plead for repeating the prophylactic injection between the fifth and eighth days whenever the wound was unusually soiled or an operation is contemplated.

Paris Médical

June 10, VI, No. 24, pp. 549-564

36 *Mixed Diseases. (Les maladies mixtes, hybrides ou métisses, en médecine d'armée.) P. Remlinger.
37 Action of Radium on War Wounds. Mme. A. Laborde.
38 Drainage of Suppurating Knee and Ankle Joints. (Drainage des arthrites suppurées du membre inférieur.) H. Chaput.
39 Gargling Syrup. (Un sirop-gargarisme.) R. Cornetoux.

36. **Mixed Diseases.**—Remlinger discusses the changes in the clinical picture when two or more diseases develop at the same time and modify each other so that the clinical picture resulting is different from either. These hybrid or mixed diseases are particularly liable to occur among troops on a campaign, in a crowd of Mecca pilgrims, and other agglomerations of persons under conditions of privation. Some of the troops early in the war, much infested with lice, developed a peculiar form of typhoid which was retrospectively diagnosed as typhoid plus typhus. The typical "hybrid" disease is that from the blending of typhoid and dysentery. The tendency of the typhoid to stupor attenuates the pains and tenesmus of the dysentery, while the latter holds down the fever of the typhoid. The puzzling picture presented is explained by the dual bacteriologic findings. Such cases have been far from rare during the present

campaign. In the French colonies in northern Africa, the hybrid picture from blending of typhus and relapsing fever is sometimes observed. In the daily practice of medicine the combination of tuberculosis and syphilis is not uncommon. The resulting hybrid lesions are found in the glands in the neck, the cornea, the skin and lungs. In the latter the tuberculous lesions generally are grafted on a syphilitic affection of the lung. The two diseases may focus on a single point; the hybrid changes are probably in the soil, but the mixed lesion that develops retains the characteristics of each disease and is not a new clinical entity. Measles and scarlet fever or smallpox may be superposed, but this is comparatively rare.

Presse Médicale, Paris

June 8, XXIV, No. 33, pp. 257-264

40 *Albuminuria Does Not Always Contraindicate Vaccination Against Typhoid. (Vaccination des albuminuriques par le vaccin charbon triple antityphoidique et antiparatyphoidique A et B.) F. Widal and H. Méry.

41 *Characteristic Changes in the Finger Prints With Traumatic Neuritis. (Les empreintes digitales dans les lésions nerveuses du membre supérieur.) R. Cestan, P. Descomps and J. Enzière.

40. **Albuminuria as Contraindication to Vaccination Against Typhoid and Paratyphoid.**—Widal and Méry have been studying the effect of this vaccination on men with albuminuria of varying intensity. The vaccine used was a triple one, against typhoid and paratyphoid, both the A and B types. No attempt was made at vaccinating men with signs of severe nephritis, but many of those vaccinated had albumin up to or beyond 1 gm. to the liter of urine. No harm from the vaccination was evident in any instance. The men passing the physical examination admitting them to active service were all in condition to stand the vaccination without injury. Those with kidneys damaged too much to permit vaccination should not be allowed on active service. Under the influence of the vaccination the albumin content of the urine remained unmodified or dropped a little or showed a briefly transient increase. In men with figured elements in the urine before the vaccination, these persisted unmodified afterward or showed a briefly transient increase. Others whose urine had been free from them before showed transiently a few reds or whites or tube-casts afterward. The urea content of the blood and Ambard's coefficient of urea excretion were determined in all the men with albuminuria. Occasionally the findings varied after the vaccination, but the fluctuations were minimal and briefly transient. In a typical case the range was from 0.37 to 0.59, and back to 0.38 four days after the third injection, while the Ambard coefficient dropped from 0.10 to 0.07. In others the range was downward. None of the vaccinated men showed any signs of renal insufficiency. Even those with pronounced Bright's disease manifested the same tolerance for the vaccinations.

41. **Finger Prints and Neuritis.**—Seven illustrations are given to demonstrate the changes that become evident in the finger prints under the influence of a traumatic neuritis. The pores may encroach on the lines, or there may be signs of desquamation or emaciation; the epidermis may be cast off, the lines show gaps, or the whole finger print becomes blurred almost beyond recognition. Among seventy men with traumatic neuritis only three failed to show some of the above typical changes in the finger prints. The changes did not seem to be proportional to the severity of the neuritis, and they did not always correspond with the innervated area. The absence of any changes in the cases of hysteria paralysis was significant. The changes which are of a trophic order were encountered almost exclusively with injury of the median and ulnar nerves.

Progrès Médical, Paris

June 5, XXXII, No. 11, pp. 81-92

42 *Lead Poisoning From Projectile in the Tissues. (Existe-t-il une intoxication saturnine par les projectiles en plomb retenus dans l'organisme?) Loeper and G. Verpy.

43 General Principles for Treatment of Wounds of Soft Parts. (Traitement général des plaies des parties molles.) M. Sénéchal.

44 Simplified Litter Bed. (Le brancard-souleveur.) Rehm.

42. **Lead Poisoning from Projectile in the Tissues.**—Loeper and Verpy noticed that a number of men who had apparently quite recovered from their gunshot or shell wound presented anemia, albuminuria or intestinal or nervous disturbances for which no explanation could be found unless the projectile still left in the tissues could be incriminated. A positive reaction for lead was obtained in the urine from six of the sixteen men tested. The projectile was a scrap of lead in these cases. Intact bullets did not seem to induce lead poisoning, being jacketed with another metal. Some of the men with a 20 gm. shrapnel ball in their tissues eliminated daily for months 15 mg. lead in the urine. The absorption of lead from the projectile varies with the chemical reactions of the tissues in which it is embedded, and with the activity of the circulation in the region. Absorption proceeded most actively in suppurating foci and the lung tissue seemed to be most favorable for it. Lead was found in the urine as early as twenty-five days after the injury and it kept up in two cases for three weeks after the projectile had been extracted. Among the 38 wounded men examined, albuminuria was found in 4; high arterial pressure in 2, and severe anemia in 2; neurasthenia was pronounced in 2, with abolished tendon reflexes in the legs in one of these. In another case there was rebellious painful spastic constipation. The subsidence of these symptoms after removal of the projectile testifies to lead poisoning as a causal factor. Examination of the urine for lead will warn when the projectile is beginning to give trouble. For this they collect the urine for two or three days, decompose the organic matter with hydrochloric acid and potassium chlorate (Fresenius and Babo technic), and after treating with sulphuretted hydrogen obtain the typical reactions with the sulphate of lead in the residue.

Revue de Gynécologie, etc., Paris

XXIII, No. 5, pp. 353-440

45 *Rupture or Abortion of Bilateral Tubal Pregnancies. (Des accidents liés à la rupture ou à l'avortement des grossesses tubaires simultanées.) R. Proust and A. Buquet.

46 *Interstitial Pregnancy. (La grossesse interstitielle.) C. Waegeli. To be continued.

47 *Pedunculated Flap of Fat for Correction of Large Femoral Hernia. (Traitement des grosses hernies crurales par un greffe adipeux pédiculé.) Chaput.

45. **Bilateral Tubal Pregnancy.**—Proust and Buquet report an emergency laparotomy on a woman of 29 for sudden severe pains and persisting hemorrhage. Both tubes contained an ovum of about two months' growth. One tube had ruptured and the other was enormously congested. The adnexa were removed on both sides but the uterus was left; part of an ovary must have been left also as menstruation has continued since. They compare with this case forty-one similar observations that have been published, although in only thirty-three were the bilateral tubal pregnancies actually simultaneous. In conclusion they give the bibliographic references of eighty-two cases of bilateral tubal pregnancy on record. Their personal case closely resembles that reported by P. Finley in 1910. Among the simultaneous cases mentioned are some published in THE JOURNAL, 1912, 1913 and 1915. The necessity for careful exploration of the adnexa on the other side is emphasized anew by this group of cases. If a hematosalpinx is found on the other side it should be removed without fail, as it is liable to rupture soon. In the case reported the intense pain was felt first on one side and at the time of the laparotomy was restricted to this, the ruptured side.

46. **Interstitial Pregnancy.**—Waegeli encountered two cases of this kind last year and has compiled from the literature 150 cases. The accompanying data were so meager in thirty-eight cases that he dropped them from the list. His study of the subject therefore is based on 112 published cases and minute study of his own two cases. In the latter, intra-ovular hemorrhage entailed abortion at the sixth week, while the pregnancy reached the fourth month in the other case. In both the intramural development of the ovum was complete. The article is to be continued, Waegeli wishing

to discuss the classification of interstitial pregnancies, the etiology, symptomatology, pathologic anatomy, diagnosis and treatment.

47. **Fat Flap to Correct Femoral Hernia.**—By using a pedunculated flap of adipose tissue, Chaput succeeded in obliterating the opening with a firm and healthy living pad cover. The incision is that for an inguinal herniotomy. Then he divides the anterior wall of the inguinal canal and thus obtains access to the femoral ring, after having pushed aside the spermatic cord or the round ligament. He draws up the hernial sac into the wound if the hernia can be reduced. If not, he resects the sac through an incision in the thigh. No attempt is made to suture the femoral ring; it is obliterated by suturing over it the flap of adipose tissue 1 cm. thick, the base at the lowest point, corresponding to the pubis, the internal margin to the median line. This pedunculated flap is brought down between the peritoneum and the abdominal wall, after resecting its skin surface. The flap is sutured to the ligaments of Gimbernat and Cooper and to the crural arch. This is facilitated by slitting the flap for 2 cm., one strip passing behind and one in front of the femoral vein. He has applied this technic to three women and two men. The flap healed in place and the hernia was completely corrected, although the opening had not been made smaller, but merely covered with the flap. No by-effects or complications were ever observed and the technic, he says, is simple, easy and certain to succeed.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 3, XLVI, No. 23, pp. 705-736

48 Tuberculosis From the Standpoint of Health Insurance for Soldiers. (Tuberkulose und Militarversicherung.) R. Staehelin.

49 Rarity of Anemia Among Persons Who Eat Pod Vegetables in Abundance. (Anémies et chlorophylle.) H. Maillart.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 25, XXXVII, No. 42, pp. 657-672

50 Means to Avoid Unnecessary Amputations. (Per limitare le mutilazioni.) G. Perez.

May 28, No. 43, pp. 673-688

51 *Utilization of Grapes in Standard Diet. (Cura d'uva, derivati dell'uva e digeribilita degli alimenti.) E. Bertarelli.

52 Gas Gangrene. S. G. Torino.

June 1, No. 44, pp. 689-704

53 The Reaction of Degeneration Remote From Point of Attachment of Muscle. (La reazione degenerativa a distanza.) L. Siciliano.

51. **Grapes as an Article of Food.**—Bertarelli discusses some recent research in Italy aiming to utilize grapes more than hitherto in the standard diet by making them into suitable food preparations. The unfermented juice of grapes and the pulp mixed with milk, ground meat, blood or the yolk of eggs seems to modify the protein in such a way as to make it keep much longer and make it more readily digestible. This phenomenon of the preserving property of the derivatives of the grape is still an unexplained mystery, but Bertarelli says that he has proved that the phenomenon may be counted on, and that vine-growing countries have here an important source of food supply in the production of new articles of diet by various combinations of proteins with the derivatives of the grape.

Policlinico, Rome

May 28, XXIII, No. 22, pp. 677-708

54 Mycosis Localized in the Throat. (Una nuova micosi con localizzazione nella gola, osservata per la prima volta a Catania.) G. Basile.

55 *Diagnosis of Bilateral Cystic Kidney; Two Cases. (Sulla diagnosi del cistoma multiloculare bilaterale del rene. Contributo clinico ed anatomo-patologico.) S. Rolando.

June 4, No. 23, pp. 709-740

56 Gastritis in Rabbits From Roentgen Exposures. (La radiogastrite ulcerosa nel coniglio, con speciale riguardo all'azione dei raggi secondari del bismuto.) F. Ghilarducci.

57 Apparatus for Extension of Fractured Leg. (Apparecchio a trazione per fasciature gessate nelle fratture dell'arto inferiore.) T. Cavazzani.

55. **Diagnosis of Cystic Disease of the Kidney.**—Rolando reports two cases, the patients women of 35 and 57, which illustrate anew the remarkable way in which the kidneys are able to perform their task without symptoms even when studded with cysts. Zones of normal tissue are able to carry on the functioning. The bilateral occurrence and the lack of metastasis testify against malignant disease. The patients usually apply for relief merely from the tumor. In one of the cases reported, one of the enlarged kidneys had sagged down into the iliac fossa while the other had become displaced upward, pushing up the left diaphragm. This was the case also in the second patient, the left kidney being quite hidden under the pushed up diaphragm.

Riforma Medica, Naples

XXXII, No. 13, pp. 337-364

58 *Interposition of Intestine Between Liver and Diaphragm. (La epatoptosi parziale da interposizione.) F. Perussia.

59 Experimental Research on the Significance of Local and Generalized Eosinophilia and of Increased Numbers of Leukocytes With Basophil Granulations. (I granulociti acidofili e basofili.) G. Grosso. Concluded.

No. 14, pp. 365-392

60 *Intravenous Vaccine Therapy of Typhoid. (Nuove osservazioni e considerazioni sulla vaccinoterapia endovenosa nel tifo.) A. Fagiuoli.

61 Antibodies in Serum of Rabbits Vaccinated Against Typhoid. (Sostanze immunizzanti comparse nel siero degli animali vaccinati con tifo.) F. Lanzetta.

62 *Physiologic and Therapeutic Action of Training the Respiratory Apparatus. (Rieducazione dell'apparecchio respiratorio.) G. Boeri. Concluded in No. 15.

58. **Liver Pushed Down by Interposed Loop of Intestine.**—Perussia relates that in the last six years he has encountered a number of cases of partial ptosis of the liver for which organic changes in the gastro-intestinal tract were directly responsible. These displace the bowel and a loop is liable to become interposed between the diaphragm and the liver. In three of the five most typical cases there was stenosis of the pylorus with gastrectasia; in the other two, hour-glass stomach from an ulcer, and the colon was unusually large. In all the cases the interposed loop of the colon was distended, and the degree of ptosis of the liver was proportional to the distention of the stomach or bowel or both. Analyzing the cases of hepatoptosis from interposition on record, he found some anomaly in the gastro-intestinal tract in all. This suggests that the main cause of sagging of the liver under these conditions is not from changes in its sustaining apparatus, as hitherto assumed. It is secondary to abnormal conditions in the stomach or bowel or both, either directly or by the increased intra-abdominal pressure.

60. **Vaccine Therapy of Typhoid.**—Fagiuoli has been treating typhoid systematically of late with a vaccine prepared by Vincent's technic, injecting into a vein from 150,000,000 to 300,000,000 killed germs. Larger doses than this are liable to bring on collapse. The details of a few cases are related to demonstrate the advantages of this treatment. He says that the injection is followed by an intense and prolonged chill, the temperature runs up to 104 F. or more, and there is often vomiting, with or without delirium, while the pulse and respiration grow faster. Heart tonics should be given as needed. The fever subsides in a few hours, almost always within twenty-four hours, with sweating, and this defervescence is almost always final. The general improvement is marked and the typhoid bacilli disappear from the stools. The charts show this sudden drop in temperature. The injection was made at the twelfth or fourteenth day in the three cases described. There was one relapse among the twelve patients given this vaccine treatment. It developed the ninth day after defervescence, but subsided promptly after injection of half the usual dose of vaccine. A single intravenous injection seems to be equivalent to three or four subcutaneous injections, and the latter are by no means always exempt from by-effects.

62. **Training the Respiratory Apparatus.**—Boeri's account of his extensive experiences in this line demonstrates that not merely better functioning can be realized by the training exercises but the lungs and chest measure can be permanently enlarged. The breathing capacity is augmented and bad habits of breathing are overcome, with the insep-

arable consequent improvement in the circulation. The exercises he advocates are simple and not fatiguing, and are practiced for five or six to ten minutes several times a day. They can be done reclining or erect, deep inspiration and expiration accompanying some regular movement of the arms or trunk. Boeri urges to have records taken of the circumference and diameter of the chest during the different phases of respiration, before and after, comparing the findings with the spirometer, pneumomanometer, pneumograph, stethograph, and roentgenoscopy. He gives specimen curves of these various findings during courses of training of this kind, taken from both children and adults. They demonstrate beyond question the benefit derived, and show that the functional tests are far more instructive than the chest measurements. The latter may represent merely the residual air.

Semana Medica, Buenos Aires

XXIII, No. 15, pp. 407-434

63 *Mitral Stenosis. (Estrechez mitral.) C. P. Mayer.
64 Impotency and Matrimony From Forensic Standpoint. (A proposito del libro del Dr. D. S. Cavia, "La impotencia y el error en la persona en el matrimonio," 1915.) J. V. Gnecco.
65 Dengue. F. Otero.
66 The Responsibility of the Physician From Forensic Standpoint. (De la responsabilidad medica.) A. Stucchi.

No. 16, pp. 435-462

67 *The Sanitary Condition of Brazil. (Estado sanitario del pais. Sus progresos y como se realizaron.) J. Penna.
68 *Thyroid Treatment of Contracture From Rheumatism. (Retracciones tendinosas post-reumaticas, y opoterapia tiroidea.) R. G. Pizarro.
69 Medical Ethics. (Etica profesional, deontologia especial y moral medica.) A. Stucchi.

No. 17, pp. 463-490

70 Apparatus for Artificial Pneumothorax. C. Mainini.
71 Report on Public Health Matters Throughout Brazil. (La futura sanidad de los territorios nacionales.) F. Otero.

No. 18, pp. 491-518

72 Post Partum Ileus. (Oclusion intestinal post parto.) E. Mazzini.
73 Plasmogenesis. (Inducciones plasmogeneticas.) V. Delfino.
74 *Infant Mortality in Brazilian Province. P. Ivanissevich.

63. **Mitral Stenosis.**—Mayer lays great stress on tonics and nourishing food for patients with mitral stenosis who have not yet reached the asystole stage. General massage is useful and stimulating lotions, while avoiding physical exercise and worry. The girl with mitral stenosis should not get married; if married, she should not become pregnant; if a child is born, she should not nurse it. When the stage of asystole is reached, heart tonics are called for. He gives digitalis in a mild form for ten or fifteen days and repeats this every month.

67. **The Sanitary Condition of Brazil.**—Penna is chief of the national public health service, and he states that the mortality for the country has dropped gradually from 18.92 per thousand inhabitants in 1911 to 15.39 in 1914. The mortality in Rio for the same year was only a trifle lower, namely, 15.25 per thousand. He gives tables of statistics which show among other things that the preventable infectious diseases are responsible for a larger share of the mortality than in other countries, as the proportion of constitutional, inherited diseases is comparatively small. Infant mortality is alarmingly high, forming 38.24 per cent. of the total deaths in 1911 and 36.55 per cent. in 1914. In the systematic campaign against rats, which is being constantly waged, all the railroad stations were freed from rats and the rolling stock disinfected. Smallpox has been vaccinated out; from 4,024 cases in 1911 there were only 17 in 1914, a total of 3,035,702 persons having been vaccinated during these four years. The total population of Brazil is 7,784,644 (1914). Flying squadrons of vaccinators were sent throughout the country. Each of the nine provinces has its central hospital and antimalaria service, with ambulance and portable steam sterilizer. The physician in charge has one sanitary guard and eight subordinates. These are all in daily communication with the central bacteriologic institute and vaccine headquarters, and the whole system is working finely. If kept up along these lines he thinks the mortality can be reduced to 10 per thousand in time, but he deplores that congress with ill advised economy has recently reduced the appropriations for this service.

68. **Thyroid Treatment of Contracture.**—Pizarro's patient was a girl of 15 who had had three attacks of acute articular rheumatism. The latest attack left contracture of the tendons of both hands rendering them useless. As the contracture persisted unmodified after ten days of ordinary measures, salicylates, iodid and massage, Pizarro stopped them all and started a course of thyroid treatment. Benefit was apparent by the sixth day and by the twentieth normal conditions had been completely restored.

74. **Infant Mortality in Brazil.**—Ivanissevich refers only to the province of Mendoza where the infant mortality is exceptionally high, reaching 200 per thousand. Out of the 7,300 deaths in Mendoza in 1914, 4,229 were of children under 5. Rivadavia, with 18,000 inhabitants, and a revenue of over $46,000 appropriated only $63 for the care of the sick poor during a recent year. Another town with a revenue of $130,309 spent $64 for this purpose, and six others with about $70,000 revenue did not spend one cent for this purpose.

Russkiy Vrach, Petrograd

XV, No. 14, pp. 313-336

75 *Aplastic Anemia and Its Relation to Other Forms of Anemia. (Aplasticheskoe malokrovie i ego otnoshenie k drugim formam anemii.) V. E. Predtechensky.
76 *Pathology, Symptoms and Treatment of False Aneurysms. A. A. Opokin.

75. **Aplastic Anemia.**—Predtechensky says that it is necessary to admit the existence of primary aplastic anemia caused by congenital hypoplasia of the bone marrow. This form of anemia from defective development of the bone marrow may be fatal. It is usually combined with hypoplasia of viscera. Frequently the congenital hypoplasia of the bone marrow is associated with hemorrhages, and this may result in various types of anemia. They may resemble post-hemorrhagic anemia with leukocytosis and the presence of normoblasts, in case the bone marrow is naturally strong and healthy. When, however, the hypoplasia of the bone marrow is very marked, these forms of anemia clinically resemble the aplastic type. Congenital hypoplasia of the bone marrow is frequently combined with hemolytic agents. The result may be various forms of malignant anemias which may resemble classic pernicious anemia if the bone marrow is naturally healthy, but with congenital hypoplasia of the bone marrow, the anemia is more apt to be of the aplastic type.

76. **False Aneurysms.**—Opokin has found false aneurysms during the present war comparatively often; namely, in 5.2 per cent. of blood vessel wounds. In about 15.2 per cent. of the cases they are caused by fragments of artillery shells. Infection prevents formation of a true aneurysm. In 30.7 per cent. of the cases the aneurysms involved both vein and artery. Operative treatment of pseudo-aneurysms is indicated not by the length of time that has elapsed since the lesion, but by the force of the arterial collateral branches, as determined by the sphygmomanometer. Ligation was the principal method of treatment. Suturing was contra-indicated on account of the infection, infiltration of the walls of the blood vessels, presence of large cavities after removal of the accumulated blood, etc. Excision of the involved portion of the vessels, as near the injured portion as possible, with preliminary ligation, gave quite satisfactory results. In 76.4 per cent. of the cases of these false aneurysms and in 100 per cent. of the arteriovenous variety, the patients recovered.

Prakticheskiy Vrach, Petrograd

XV, No. 11, pp. 101-112

77 Improved Blood Counting Chamber. (O dvukh kombinatsiakh schetnoikameri prof. Bürker s sietkoe prof. V. E. Predtechenskago.) S. I. Kliuchareff.

Hospitalstidende, Copenhagen

June 7, LIX, No. 23, pp. 545-568

78 *Atrophic Chronic Nasal Catarrh. (Om Ozaena. Med særligt Henblik paa Coccobacillus foetidus ozænae—Perez.) K. E. Salomonsen. Commenced in No. 22.

78. **Etiology of Chronic Fetid Nasal Catarrh.**—Salomonsen reviews the history of ozena and the various theories as to its etiology, and then describes extensive personal research with Perez' "coccobacillus of fetid ozena." An international collective inquiry on the subject of ozena was launched at the third international laryngology congress, and early in 1914 the committee in charge of it sent out notices urging special research to confirm Perez' and Hofer's statements in regard to Perez' coccobacillus. Salomonsen inoculated over thirty-eight rabbits with nasal secretions from twenty-eight patients with ozena, and thorough bacteriologic tests were applied to the findings. His report fills thirty-four pages, and all his conclusions are negative as to the Perez' coccobacillus.

Hygiea, Stockholm

LXXVIII, No. 10, pp. 611-720

79 *Histologic Structure of Pituitary Body and Its Tumors and Their Connection With Acromegaly. (Hypofysens och hypofysadenomens histologiska byggnad samt deras förhållande till akromegalien.) G. Kahlmeter.
80 *Theoretical Explanations for Transposition of Viscera. R. Naucler.
81 *Bone and Joint Tuberculosis From Modern Standpoint. (Nyare åsikter om ben- och ledgångstuberkulosen.) P. Silfverskiöld.
82 *The Water Level in Examination of the Chest. (Vattenpasset i läkarens hand.) C. E. Waller.

79. **Pituitary Tumors and Their Connection with Acromegaly.**—The conclusions from Kahlmeter's review of recent literature on this subject are sustained by the findings in a case reported in which a miller, 45 years old, died from effects of an adenoma of the pituitary body. The first symptoms had been noted ten years before, disturbance in vision and headache. There were no signs of acromegaly at any time. Analysis of this and similar cases seems to indicate that pituitary tumors of the adenoma type, with cells which do not take the acid stains, do not induce a tendency to acromegaly, while acromegaly is practically a constant accompaniment of such tumors when they are of an acidophil structure. This assumption sustains the view that the acidophil granula is the active principle of the secretion of the pituitary body, and that excessive production of this is what entails acromegaly.

80. **Transposition of Viscera.**—Naucler discusses the various theories that have been advanced to explain why this ever occurs, illustrating his statements with a typical case of total inversion of the viscera. The findings did not afford any special support for any of the theories described. Gruber says that total inversion is three times more common than partial inversion. The majority of such persons die of pulmonary tuberculosis, as in the case here described.

81. **Bone and Joint Tuberculosis.**—Silfverskiöld comments on the changes which the last three or four years have brought in our views on bone and joint tuberculosis, and discusses the leading works that have appeared on the subject. Andvord, in Norway, and C. Rivière regard infection of children with bovine tuberculosis as almost a mild immunization process. Rivière's publication on the "protective role of the bovine bacillus" was hailed by Meissen of Essen as "not so paradoxic as it seems at first glance." The great danger from the tubercle bacillus is because it can find a firm foothold in the body without causing symptoms. As the focus can develop without causing much local irritation, the phagocytes are not attracted to the spot, and this negative or weak chemotaxis, especially in the secondary lesions, autoreinfections, is the secret of the gravity of bone and joint tuberculosis. Our present methods of treatment, immobilization and injection of iodoform, fail in so many cases because they act counter to Nature instead of imitating Nature's healing processes. The time is ripe for a complete revolution in our treatment of bone and joint tuberculosis, he declares. In the first place, he insists that every child should have the tuberculin skin test applied at regular intervals every few years. When a bone or joint tuberculous lesion is suspected, some substance should be injected to induce chemotaxis. Even if the exact localization of the focus is not possible, chemotaxis induced in its immediate vicinity will act on it practically the same as if directly in it. The main point is to detect and act on the lesion while still in its incipient stage. Operative measures during the early stages are simple and harmless, he reaffirms, while they do away with a constantly growing menace. He bores a passage into or close to the focus and tampons with iodoform gauze for a few days or until the vessels are plugged with thrombi, and granulation has begun. Then he scrapes out the focus and works into it a strip of gauze impregnated with turpentine ointment or 50 per cent. camphor-naphthol. This tampon is renewed every day until the focus is suppurating freely. After this the intervals can be lengthened until finally the cavity begins to fill up. His experience with treatment on these principles has been extremely favorable, and he thinks it is applicable also to tuberculous vertebral disease, although he has not happened to encounter any such cases in an early stage. He describes a technic, however, that he has worked out on eight cadavers and which seems to answer every purpose. The aim is to imitate Nature by mobilizing the defensive forces at the spot before the enemy is too well entrenched. As a destructive process always spreads along the line of least resistance, the pus and infectious matters escape through the opening made to introduce the chemotaxic substance. Among the 2,606 cases of bone and joint tuberculosis requiring institutional care in Sweden in 1913, there were forty-one helpless cripples from this cause. Recent figures from Prussia gave 11,300 children more or less crippled from the same. He suggests that the benefit from heliotherapy may be due to the action of the chemical rays on the leukocytes similar to their action on amebas, the ultraviolet rays repelling them, driving them inward, and rendering their ameboid movements and vital processes more active.

82. **The Water Level in Examining a Patient.**—Waller uses a wood, brass and glass water level, about 20 cm. long, and lays it on the chest at the close of expiration. Any asymmetry in the behavior of the chest walls is rendered evident at once as the patient breathes. Pulmonary processes, hemorrhage and other conditions can in this way be traced to the lung and the part of the lung responsible.

Norsk Magazin for Lægevidenskaben, Christiania

June, LXXVII, No. 6, pp. 717-844

83 *Drugs in Treatment and Prophylaxis of General Paresis and Tabes. (Bidrag til spørsmaalet: Den moderne medikamentelle behandling av paralyse og tabes.) W. Holland.
84 History of Teaching of Dermatology and Psychiatry in Norway. H. Hopstock.
85 *Rupture of Liver of Girl of Twelve; Recovery After Operation. (Ruptura hepatis helbredet ved operation.) P. Bull.
86 *Climatic Factors Probably Responsible for Character of Epidemics. (Hvorledes man finder genius epidemicus.) A. Magelssen.
87 Intramuscular Arteriovenous Angioma. A. Vetlesen.

83. **Treatment of Tabes and General Paresis.**—Holland declares that in spite of the progress realized in the treatment of syphilis in the last few years—or possibly because of it—the physician's task is no lighter than formerly, but more responsible and with new problems to solve. Treatment of syphilis in the primary and secondary stages must be continued until the Wassermann reaction has been negative for some time and the spinal fluid gives negative findings. The patients must be reexamined every year or so for ten years. In eighty-five cases of tabes or general paresis in his service and ninety-three cases of various other forms of cerebrospinal syphilis, since 1903, only one patient was known to have had systematic intermittent treatment through two years. In forty-nine others treatment had been exclusively symptomatic. The details of treatment were not known for the other patients. Courses of nucleinic acid, tuberculin and salvarsanized serum in tabes or general paresis proved absolutely useless. The cerebrospinal fluid usually gave a negative response finally to the four usual tests, and the symptoms from meningeal involvement retrogressed, but no improvement was apparent in the clinical picture of the tabes or paresis. The only hope, he reiterates, is to start treatment in an early stage, but when the patient becomes alarmed about his condition and applies for treatment, it is then too late for it. It is possible that certain strains of the pale spirochete have a special affinity for the

central nervous system. This view is sustained by the cases in which tabes or paresis develop in persons infected from the same source or in husbands and wives. He has had a few cases of this kind, but he thinks a constitutional predisposition is more likely. In one of his families, two brothers died at 43 and 48 of general paresis, and a third is insane. In another family, one man of 50 died of general paresis, his brother of 41 is being treated for cerebral syphilis which developed seven years after the infection, and a third brother has tabes.

85. **Operative Treatment of Rupture of the Liver.**—Bull's patient was a girl of 12 and the bleeding was severe. She seemed to be doing well after the prompt laparotomy and suture of the liver, but the fifth day symptoms of peritonitis became evident requiring further intervention. Bile oozing from the suture was responsible for the peritonitis and also for an effusion in the pleura. Recovery was complete in two months. In Thole's compilation of 752 cases of injury of the liver given surgical treatment, the mortality was 39.5 per cent. of those in which the interval before the operation was less than six hours. It rose to 86.3 per cent. with an interval of twenty-four hours or longer. In the 188 cases with simple rupture—like the case reported—the mortality was 55.85 per cent. and in over three-fourths of these the bleeding was the direct cause of death. Bull thinks that in his case the girl's life was saved by the two liters of saline infused into the saphena before and during the operation.

86. **Meteorologic Factors as Influencing Character of Epidemics.**—Magelssen gives charts showing the general mortality at Christiania in connection with the average temperature curves through eight decades. They parallel each other, rising and falling together, and the same is evident in charts showing conditions in Berlin, Stockholm and Copenhagen. These curves demonstrate that the fluctuations in the mortality cannot be ascribed to the merit of hygiene alone. They seem to be dependent on the temperature or some unknown factor closely connected with it, which controls the fluctuations in the mortality, the *constitutio epidemica.*

Ugeskrift for Læger, Copenhagen

May 25, LXXVIII, No. 21, pp. 831-878

88 *Pseudoleukemia in Children. (Om Pseudo-Leukæmi hos Børn.) C. E. Bloch.

89 Abortive Copper Ionic Medication of Soft Chancre. (Abortivbehandling af Ulcus molle med Kobber-Jontoforese.) O. Jersild.

90 Combination of Renal and True Diabetes. (Et Tilfælde af Diabetes.) E. Begtrup.

June 1, No. 22, pp. 879-926

91 *Diagnosis of Typhus. (Om exantematisk Tyfus, navnlig dens Diagnose.) S. T. Sörensen.

92 *Periodic Acetonemia in Children. V. Scheel.

93 The Continuous Bath for Chronic Suppurating Hip Joint Disease. (Permanent Bad.) H. R. Magnus.

88. **Pseudoleukemia in Children.**—Bloch applied roentgenotherapy systematically and perseveringly in five of the six cases he reports. The effect was pronounced in all, the tumors retrogressed, the general health and the blood picture improved. The intermittent fever also subsided and the children seemed to be cured, only a few small hard lymph glands could still be palpated, no more than are found sometimes in apparently healthy children. This improvement was not permanent, however, the anemia and fever returned and the number of leukocytes rose again, but the lymph glands did not enlarge. Under renewed roentgenotherapy, the fever and anemia declined again, but there was little or no influence apparent on the enlarged spleen and the palpable glands. The lymph glands seemed to cease to respond to the Roentgen rays in time. Reclining out of doors seemed to have a favorable influence; when there was fever the children were kept in bed. It seems to be possible thus by combining arsenic and roentgen exposures to keep the disease down so that the children can lead a fairly satisfactory existence, but a cure is out of the question. Even this much can be said only of the chronic cases. In the acute cases, although the tumors retrogressed notably, yet the general condition did not seem to be influenced in the least, and the roentgenotherapy seemed to depress the child's spirits, and consequently it was not applied in the sixth case. All that could be done was to relieve with opiates and complete rest. Otherwise the roentgenotherapy had no unfavorable effects. There was no albuminuria or other symptom of toxic action although the destruction and absorption of tumor tissue was on a large scale. At first the exposures were made only during afebrile periods, but later no attention was paid to this. In the first three cases the neck began to swell without known cause in children between 3 and 5. In six months the broad tumor in the neck had attained a large size but the general health persisted good, the trouble seeming to be a local one at first. In the three other children, from 2 to nearly 5 years old, the disease developed in an acute form and proved fatal in from one to three months. In these three acute cases both parotid glands were much enlarged and tender, as in mumps, but they subsided nearly or entirely under Roentgen exposures. Bloch does not know of any other acute cases on record with these parotid tumors. In one of the acute cases subperiosteal flat, tender tumors developed on the skull and pushed both eyes out of their orbits. These tumors did not develop until the leukocytes had dropped to 4,000. The bones of the skull seemed to attract the lymphocytes, causing the tumors. Such tumors have been observed in a number of cases, usually in children; in several cases deafness developed from infiltration of the internal ear with lymphocytes. There was green pigment in some of the tumors in one case. Some writers might call the case one of chloroma and the two others, Mikulicz' disease, but Bloch says that all three are typical pseudoleukemia. This disease thus occurs in children, both in the acute and chronic form, and does not differ from the clinical picture in adults more than one would expect.

91. **Typhus.**—Sörensen reviews his experience with a small epidemic of typhus in Denmark in 1893, a total of forty-three cases, and discusses recent publications on the subject. The first case was mistaken for scarlet fever at first, although there were no tender glands and no hyperemia on the skin between the small patches of the eruption on trunk and limbs, the eighth day, and the patient was inclined to be delirious, the tongue dry and fissured. The fever of 39.5 C., dropped with the typical zigzag course to normal the twenty-third day of the disease. In another case the temperature ranged from 40 to 41.1 C. for an average of twelve days; defervescence followed on the twentieth day. Sörensen recalls that thirty-one cases of gangrene of the legs were known in the great epidemic of typhus in Finland, 1866 to 1868, in which 14,000, 21,000 and 60,000 persons died.

92. **Periodical Acetonemia in Children.**—Scheel's two patients were little girls under 3 and 7. The attacks of uncontrollable vomiting, accompanied by the odor of acetone in the breath, and their periodical recurrence were typical of this affection which he calls Marfan's disease. The explosive vomiting and the intense thirst may be accompanied by albuminuria, fever and rapid pulse, and the acetone may be eliminated in urine and vomit as well as in the breath. The trouble is evidently an acidosis as in diabetes, but both the acidosis and the vomiting are undoubtedly the result of some other factor, some periodically recurring anomaly in the metabolism. In the younger child the urine contained 0.2 and 0.35 gm. of sugar. The child was recovering from nephritis and the sugar content of the blood was normal. Others have stated that glycosuria is never encountered with this periodical acetonemia. In this case there was no further glycosuria after subsidence of the attack. The latter had commenced with convulsions, but there was no vomiting. He has seen cases of periodical vomiting in adults, accompanied by acetonemia, and it is a question whether this is the same as Marfan's disease in children. As everything is vomited up, an alkali cannot be given to combat the acidosis; it is too irritating by the rectum. More important than doing anything to relieve the patient is the refraining from doing the wrong thing. One is apt to be misled into diagnosing some surgical affection, while operative measures are superfluous to say the least.